R E P O R T  R E S U M E S

ED 017 441 SE 001 133

SCIENCE IN THE ELEMENTARY SCHOOL, GRADE 3, A GUIDE FOR TEACHERS.

BY- TAYLOR, MRS. JAMES L.
TUPELO PUBLIC SCHOOLS, MISS.

PUB DATE 65

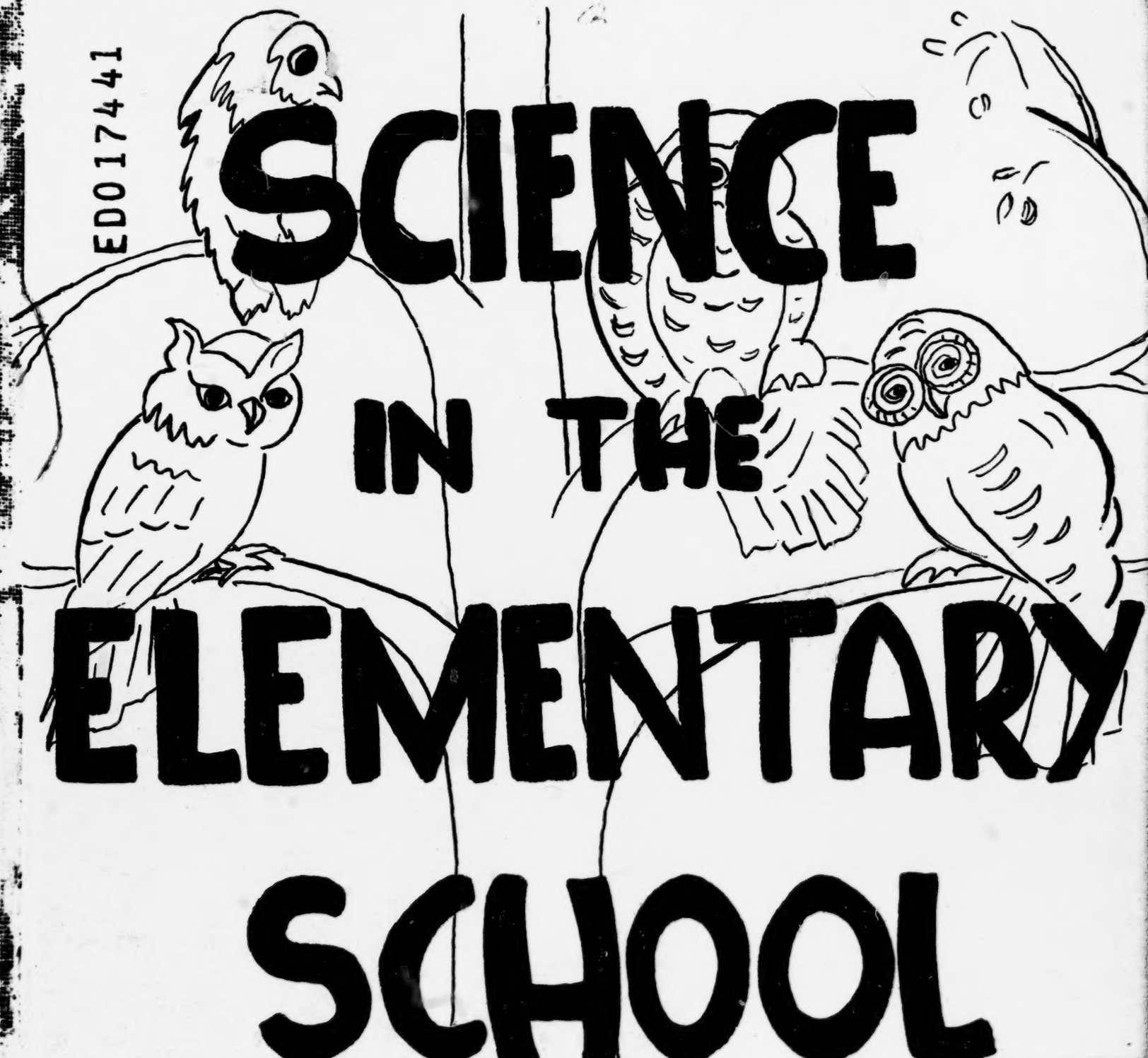
EDRS PRICE MF-$0.50 HC-$4.68 115P.

DESCRIPTORS- *BIOLOGY, *COURSE OBJECTIVES, *CURRICULUM DEVELOPMENT, *ELEMENTARY SCHOOL SCIENCE, *EDUCATIONAL TELEVISION, *GRADE 3, *INSTRUCTIONAL MATERIALS, *PHYSICAL SCIENCES, *TEACHING GUIDES, AUDIOVISUAL AIDS, EARTH SCIENCE, EDUCATIONAL PROGRAMS, ECOLOGY, FILMS, FILMSTRIPS, ZOOLOGY, MISSISSIPPI,

A COURSE OF STUDY FOR SCIENCE IN THE THIRD GRADE IS DESCRIBED. DIVISIONS ARE (1) AN INTRODUCTION WHICH PROVIDES A RATIONALE FOR THE GUIDE AND LISTS THE MAJOR CONCEPTS, (2) A SECTION WHICH LISTS THE SPECIFIC SCIENCE CONCEPTS FOR EACH LESSON AND GIVES THE SCOPE AND SEQUENCE FOR GRADES THREE TO SIX, AND (3) A SECTION WHICH PRESENTS FOUR TEACHING UNITS. THE UNITS ARE (1) ANIMALS, (2) SPACE AND EARTH SCIENCE, (3) PLANTS, AND (4) MATTER, ENERGY, AND MACHINES. INTERSPERSED IN THE UNITS ARE NINE LESSONS ON THE INTERRELATIONSHIP OF PLANTS AND ANIMALS WITH THEIR ENVIRONMENT. SPECIFIC CONCEPTS, OBJECTIVES, STUDENT EXPERIENCES, INSTRUCTIONAL MATERIALS, AND AUDIOVISUAL AIDS ARE LISTED FOR EACH LESSON. SOURCES OF INSTRUCTIONAL MATERIALS AND AUDIOVISUAL AIDS ARE PROVIDED. THE GUIDEBOOK WAS DESIGNED FOR USE WITH EDUCATIONAL TELEVISION BUT IS NOT LIMITED TO THIS USAGE. THE GUIDE IS ONE OF FOUR, THE OTHERS COVERING GRADES FOUR, FIVE, AND SIX. (DS)

DOCUMENT FILMED FROM BEST AVAILABLE COPY

ED017441



# SCIENCE IN THE ELEMENTARY SCHOOL

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
OFFICE OF EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL OFFICE OF EDUCATION POSITION OR POLICY.

## GRADE 3

## A GUIDE FOR TEACHERS

SE001 133

APR 1 0 1967

# SCIENCE IN ELEMENTARY EDUCATION

## GRADES 3-6

A GUIDE FOR TEACHERS

prepared by

MRS. JAMES L. TAYLOR

ETV SCIENCE TEACHER

TUPELO PUBLIC SCHOOLS

consultant

DR. J. DAVID MOHLER

DEPARTMENT OF EDUCATION

UNIVERSITY, MISSISSIPPI

illustrated by

MRS. MITZI MOORE

C. E. HOLLADAY, SUPERINTENDENT

TUPELO PUBLIC SCHOOLS

TUPELO, MISSISSIPPI

# TABLE OF CONTENTS


| | Page |
|---|---|
| Foreword | iii |
| Introduction | vii |
| Major Concepts | x |
| Experiences | xii |
| **PART ONE** | |
| Concepts in Science | 2 |
| Lesson One | 8 |
| **UNIT ONE** *Animals* | |
| Introduction | 11 |
| Major Concepts | 12 |
| Experiences | 15 |
| Lesson Two | 18 |
| Lesson Three | 19 |
| Lesson Four | 20 |
| Lesson Five | 22 |
| Lesson Six | 24 |
| Lesson Seven | 26 |
| Lesson Eight | 27 |
| Lesson Nine | 28 |
| **UNIT TWO** *Space-Earth* | |
| Introduction | 30 |
| Major Concepts | 32 |
| Experiences | 34 |
| Lesson Ten | 37 |
| Lesson Eleven | 39 |
| Lesson Twelve | 41 |
| Lesson Thirteen | 43 |
| Lesson Fourteen | 44 |
| Lesson Fifteen | 46 |
| Lesson Sixteen | 48 |
| Lesson Seventeen | 49 |
| **UNIT THREE** *Plants* | |
| Introduction | 52 |
| Major Concepts | 54 |

Experiences 55
Lesson Eighteen 57
Lesson Nineteen 58
Lesson Twenty 59
Lesson Twenty-One 60
Lesson Twenty-Two 61

UNIT FOUR
Matter, Energy, Machines

Introduction 64
Major Concepts 66
Experiences 69
Lesson Twenty-Three 73
Lesson Twenty-Four 74
Lesson Twenty-Five 75
Lesson Twenty-Six 76
Lesson Twenty-Seven 78
Lesson Twenty-Eight 80
Lesson Twenty-Nine 82
Lesson Thirty 83
Lesson Thirty-One 85
Lesson Thirty-Two 86
Books for Teachers 87
Supplementary Materials 88
Films and Filmstrips 89
Bibliography 90

PLATES NO.

Fun With Dale and Doug 1
Puzzle 2
Animal Kingdom 3
Plant Kingdom 4
Scope and Sequence Unit One (Animals) 5
Scope and Sequence Unit Two (Space-Earth) 6
Scope and Sequence Unit Three (Plants) 7
Scope and Sequence Unit Four (Matter, Energy, Machines) 8
Part One - Grade Three 9
Unit One - Animals 10
Unit Two - Space-Earth 11
Unit Three - Plants 12
Unit Four - Matter, Energy, Machines 13

## FOREWARD

Science must be brought to the child at an early age because of the great scope of science and our dependence upon science as a way of life. The media through which this process will operate in conjunction with this Course of Study will be the television. As long as it remains accurate, sincere, and interesting, educational television will take its legitimate place as a tool for public education in science. Printed words and pictorial illustrations are the best means of carrying science to the public. With this Course of Study as a guide and educational television as a transmitter, it can develop the learner's enthusiasm in acquiring the necessary knowledge and skill to enable him to deal with his life and environment as our society requires in this world of today. The advantages of educational television instruction are obvious in science, as this subject leads itself well in explaining and showing the problems of science.

We wish to thank all of the elementary teachers, both from our faculty and the cooperating schools, who made outstanding contributions in the development of this course of study. Many have graciously given of their time and talents as this program was being prepared.

We are fortunate to have had the important supervision and outstanding assistance of Dr. Robert W. Plants and Dr. J. David

Mohler of the School of Education of the University of Mississippi.

This Course of Study should do much toward bringing direct simple answers to the many questions that arise as we work together in bringing to the children the experiences and the joys of discovery. We trust this will be helpful to you in your teacher-learning environment.

Mrs. James L. Taylor
Educational Television Science Teacher

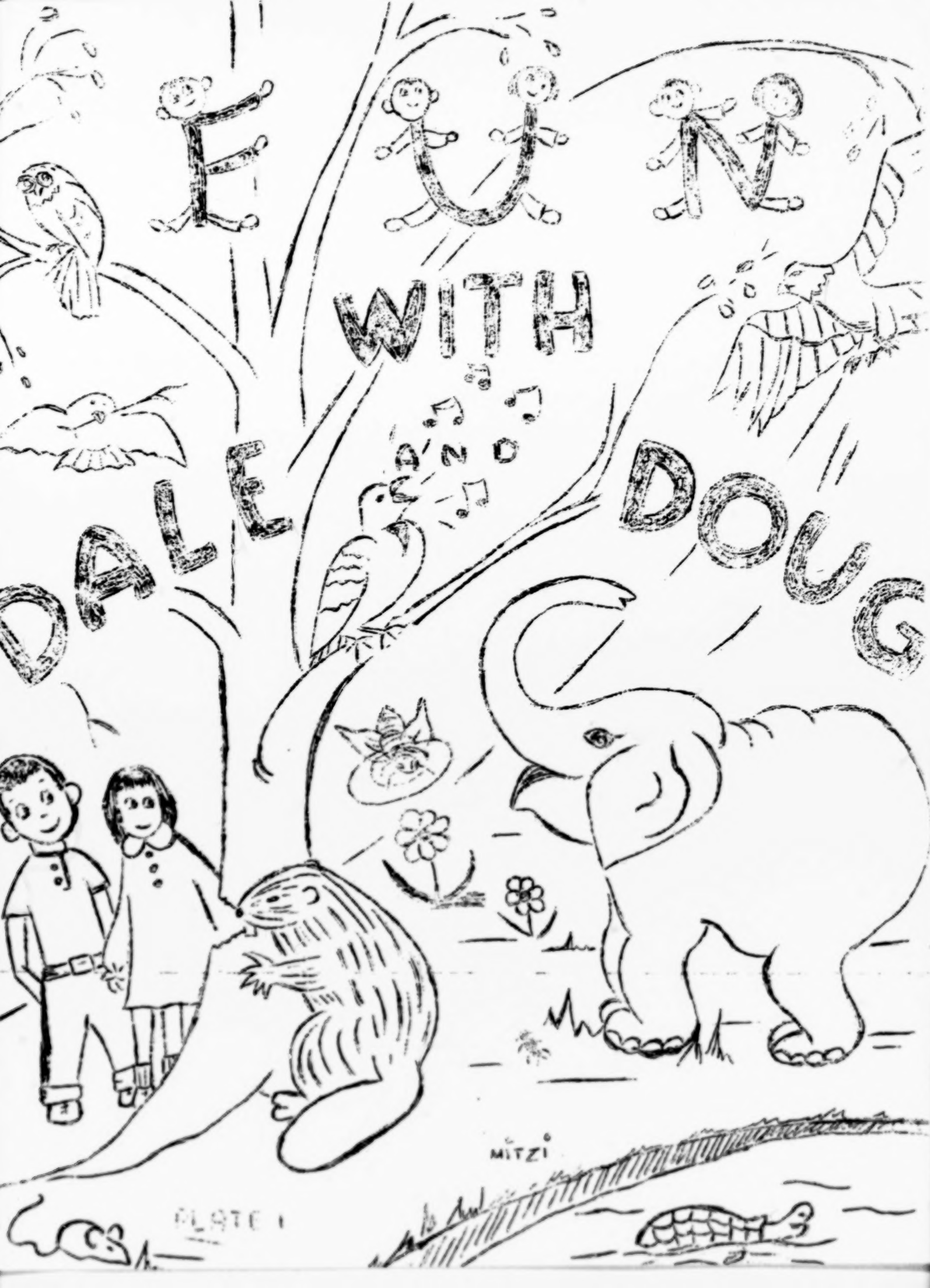
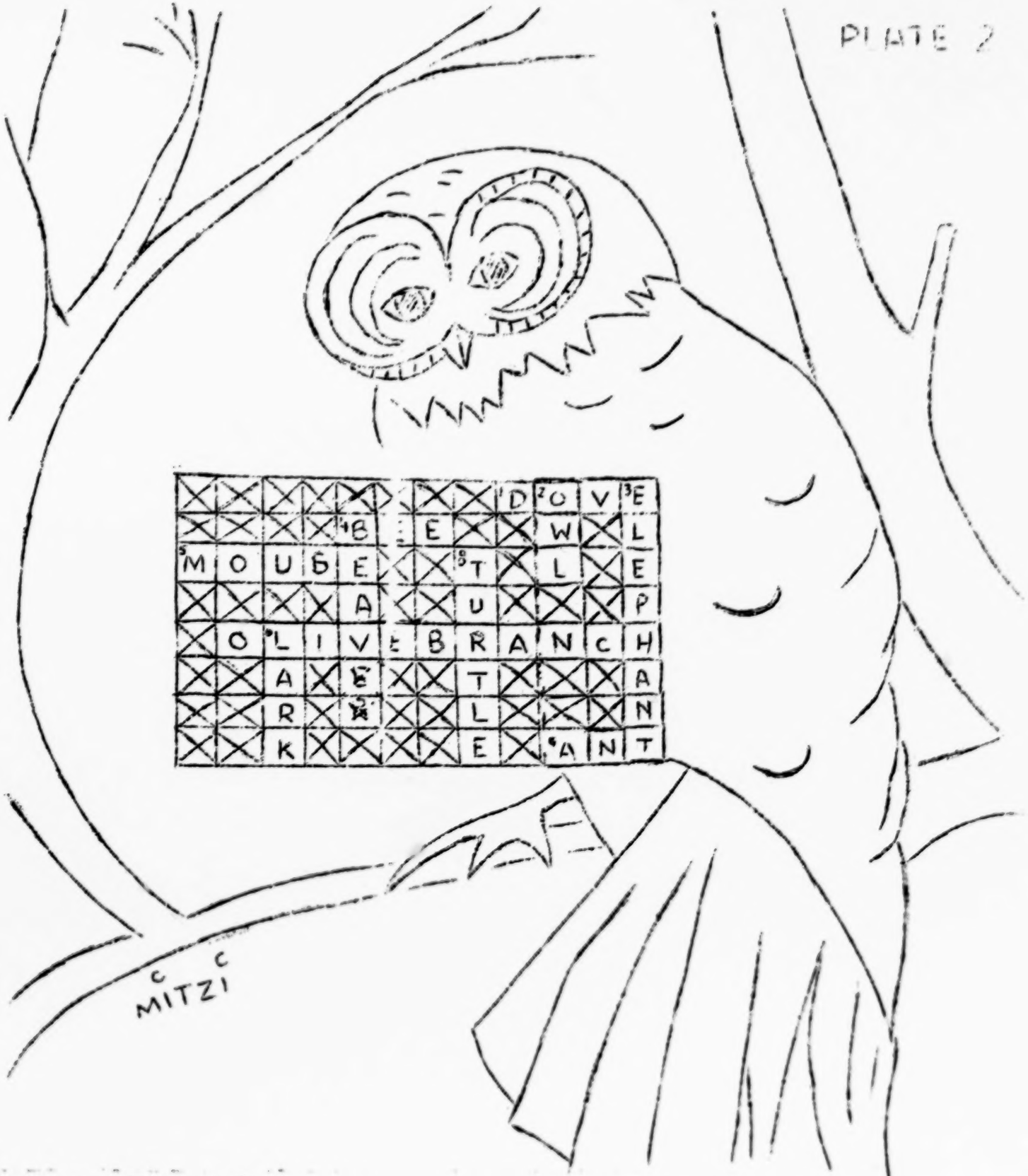

E
WITH
AND
DALE
DOUG
MITZI
PLATE 1

PLATE 2




## ACROSS

1. BIRD OF PEACE
4. BUSY AS A ___.
5. QUIET AS A ___.
7. BRANCH THE DOVE CARRIES
9. INDUSTRIOUS AS AN ___.

## DOWN

2. WISE AS AN ___.
3. LONG REMEMBERING AS THE ___.
4. AN EAGER ___.
6. HAPPY AS A ___.
8. DETERMINATION OF A ___.

# I

# INTRODUCTION

Science is being scrutinized because of its advance in technology. Modern attitudes in science are going through radical changes. There is a definite movement for children to learn and infer from their own observations. The educational system must convey traditional knowledge and culture as well as emphasize inquisitiveness and mental flexibility to the younger generation. This will help to free them for more challenging work that requires visions that will be adaptable to the new and future ideas. The present knowledge we have of science serves as a guide and not as a goal for the students' studies.

Science is of great interest to children. "The problem is not one of creating interest in science, rather, science programs must be built so that both the pre-existing interest and its natural curiosity about science, are fostered and cultivated in children."[1]

Children build their own concepts regardless of the teaching they receive. This Course of Study is to guide them in their observations, clarify their present concepts, and help them build basically sound concepts.

---

[1]Harold E. Tannenbaum, Science Education for Elementary School Teachers, Boston: Allyn and Bacon, Inc., 1965, p. 55.

The children must develop in a logical sequence as they go through the grades. They must be aided in this gaining new concepts based on previously acquired knowledge along with their new learning experiences.

This guide breaks down the areas of learning into the living and the non-living. The living area is further divided into seven lessons on animals and four lessons on plants. The non-living area is divided into space and earth science with six lessons, matter, energy, and machines with six lessons. There are nine lessons on interrelationship of animals and plants with their environment.

"Finally, there is the area of motivation through teacher interest. Here is the factor which, though most important, is most likely to be a stumbling block. Many teachers grew up in schools where science, if it was taught at all, was a "sitting down, a reading, or a memorizing subject." The spark which, as children, they had for this area of learning was extinguished by sad school experiences. Teachers need to rekindle this spark in themselves. Only as they can develop a real interest in science can they nurture this interest in children."[2]

The student is not expected to grasp all of the factual material presented in the programs. The purpose of these programs

---

[2] Ibid., p. 57-58

is to give an overview of the unity of all science and to develop an interest and curiosity on the part of the student in the things of science. It is relatively unimportant whether the student retains the majority of the details.

The purpose of this enrichment program is to introduce and broaden the basic aspects of science and the methods the scientists use. The biological and physical sciences are considered separately but are combined admirably in interrelated lessons. The living, biological science programs consider the animal for the fall study and the plant for the spring study. The fall is adaptable to studying animals while the spring time of year is especially adaptable to the study of plants. The earth sciences are studied during the winter to correlate noticeable weather changes, while matter, energy, and machines are adaptable any time of the year, so late spring was chosen.

It is not the intent of the course subject matter to duplicate the material found in the texts. It attempts to utilize the principles undertaken in the previous years and prepare a foundation for concept development in the forthcoming years.

All aspects of science are interrelated; a study of one field leads to an understanding of the others.

## II

## MAJOR CONCEPTS

A. Some things are living and some non-living.

1. Biology is the study of living things.
2. Zoology is the study of animals.
3. Botany is the study of plants.

B. To classify means to put in a group things that are alike in some way.

1. Living things are put together in one group because they have characteristics that set them apart from non-living things.
2. Living things are classified on the basis of structure in two large groups---plants and animals; these groups are divided into smaller groups; these in turn are divided into still smaller groups, and so on, down to individual species.
3. Some things on this earth are living and others are non-living.
4. Living things have special characteristics that separate them from the non-living.
5. Non-living things can be found to have some of the characteristics of the living.
6. Living things have a definite form and size.
7. Non-living things may be any size.
8. Living things have a definite length of life (except for disease and accident).
9. Living things are in a state of constant activity and depend upon a constant supply of vital energy to carry on their activities while non-living things are not in a state of constant activity and do not need a supply of energy.
10. All living things are either plants or animals.
11. Living things are able to move by themselves, take in oxygen or carbon dioxide from the air, use food, grow, reproduce like kind, and respond to stimuli.

C. All living things are made of cells.

1. Cells grow and divide.
2. Animals differ from plants in the structure of their cells.
3. Cells are grouped into tissues and tissues into organs.
4. Because of these organs all living things are called organisms.
5. The common activities of plants and animals are called life processes.

6. Plants have cell walls that make the plants stiff.
7. Animals have cell walls that make the animal flexible.

D. Most animals move about in search of food, shelter, and protection from their enemies.

1. Plants remain rooted in one place and must be equipped to withstand changes in temperature and to obtain their food.
2. All living things need oxygen but they get it in different ways; while green plants use carbon dioxide as well as oxygen.
3. Living things must have food, water, and warmth to stay alive.
4. Animals either eat plants or other animals for food.
5. Those plants that are green make their own food.
6. Some plants get their food from decaying plants and animals.
7. Living things have adaptations that help them to get the things that they need.

E. Living things grow from the inside while non-living things grow from the outside.

F. Living things have certain characteristics.

1. Living things grow by taking in food and making it a part of themselves.
2. Living things resemble their parents.
3. Plants and animals respond to outside influences in different ways.

G. Many things are non-living.

1. Rocks and minerals are non-living.
2. Wind moves but is not alive.
3. Machines move but are not alive.
4. Light and sound are forms of energy.

## III

## EXPERIENCES

A. Have the children tell the important differences in some living and non-living things they named.

B. Compare common animals and plants with other objects giving the differences between them.

C. Discuss the things that are necessary to stay alive.

D. Note when a living thing is no longer living as a tree being made into a table.

E. Illustrate that growth is a kind of movement by placing a plant so that its leaves are away from the light. After a few days note the direction of the leaves.

F. Note that the wind moves but that it lacks some of the other characteristics of the living.

G. Illustrate how the things that are needed are obtained by different adaptations.

H. Have the children breathe deeply then exercise and compare the number of times they breathe.

I. Observe the breathing of a fish in an aquarium.

J. Examine the stems of plants, such as cattails, to see the hollow stems through which air passes to the roots.

K. Ask the children to bring pictures of different animals. Discuss their food, their adaptations to get the food they need and the parts of their bodies that help them.

L. Illustrate how a green plant makes food by placing a plant in a dark place for a few days then placing it in the sunlight.

M. Show how green plants store excess food in roots (carrots, stems, potatoes) and leaves (lettuce).

N. Ask the students to trace the origin of one of the foods they had for breakfast.

O. Observe the cell of an animal and plant under the microscope.

P. Note the rolling snowball and the crystal growing. They lack some of the other characteristics of the living.

Q. Illustrate the manner in which some cells bring water to the leaves of the plant by placing a stalk of celery in water which has food coloring or ink added.

R. Show that all life depends upon the sun. Illustrate that a plant will die if it does not have sunlight and that all animals indirectly depend upon plants for food.

S. Let the children study the growth of a plant or reproduction by propagating plants by seeds, runners, cuttings, or leaves.

T. Study the resemblances of offsprings to parents by showing pictures.

U. Obtain frog's eggs, place in an aquarium, and watch the development until the tadpole emerges.

V. Examine a rock collection to decide if it is living or non-living.

W. Study simple machines to learn their characteristics.

X. Run experiments with light and sound to prove that they are not alive.

# ANIMAL KINGDOM

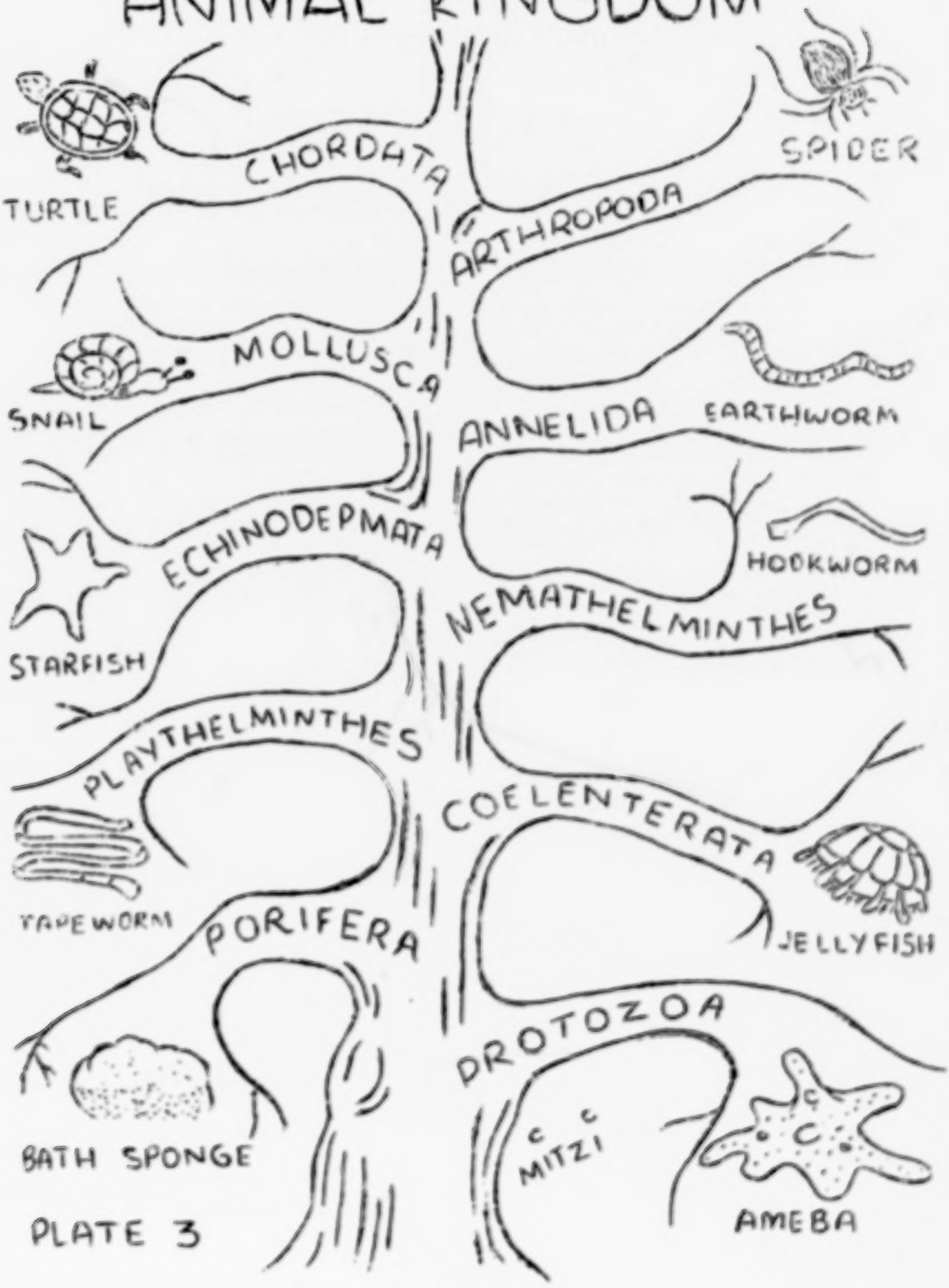



PLATE 3

# PLANT KINGDOM

DAISY

ANGIOSPERMS

SPERMATOPHYTES

GYMNOSPERMS

CONIFER

FERNS

PTERIDOPHYTES

BRYOPHYTES

MOSSES

FUNGI

MUSHROOM

THALLOPHYTES

ALGAE

RED ALGAE

MITZI

PLATE 4

SCOPE AND SEQUENCE

| WEEK | GRADE 3 | GRADE 4 | GRADE 5 | GRADE 6 |
|---|---|---|---|---|
| 1 | Introduction | Introduction | Introduction | Introduction |
| | UNIT I ANIMALS | | | |
| | GROUP | GROUP | GROUP | GROUP |
| 2 | 10-man | 9-insect | 10-man | 10-man |
| 3 | 9-insect | 10-man | 9-insect | 9-insect |
| 4 | 9-Arachnida | 9-Crustacea | 9-Myriapoda | 9-Insecta |
| 5 | 1 and 2<br>one cell - two layer | 3 and 6<br>prickly - spiny | 4 and 5<br>flatworm - roundworm | 7 and 8<br>sectionworm - Mollusk |
| 6 | 10-birds | 10-reptiles | 10-amphibians | 10-fish |
| 7 | 10-mammals | 10-mammals | 10-mammals | 10-mammals |
| 8 | 10-pets | 10-pets | interrelated | interrelated |
| 9 | interrelated | interrelated | | |

PLATE 5

UNIT
II
SPACE - EARTH

| | | | | |
|---|---|---|---|---|
| 10 | space-solar system | space-constellations | space-milky way | space-zodiac |
| 11 | space-moon | space-time | space-time | space-time |
| 12 | earth-weather | earth-watercycle | earth-precipitation | earth-winds |
| 13 | interrelated-safety | interrelated-safety | interrelated-safety | interrelated-safety |
| 14 | earth-dinosaurs | earth-changing | earth-rocks, minerals | earth-rocks |
| 15 | earth-lithosphere | earth-volcanoes | earth-earthquakes | earth-mountains |
| 16 | earth-ocean floor | earth-oceans | earth-ocean floor | earth-glaciers |
| 17 | interrelated-seashore | interrelated-desert | interrelated-ponds | interrelated-forests |

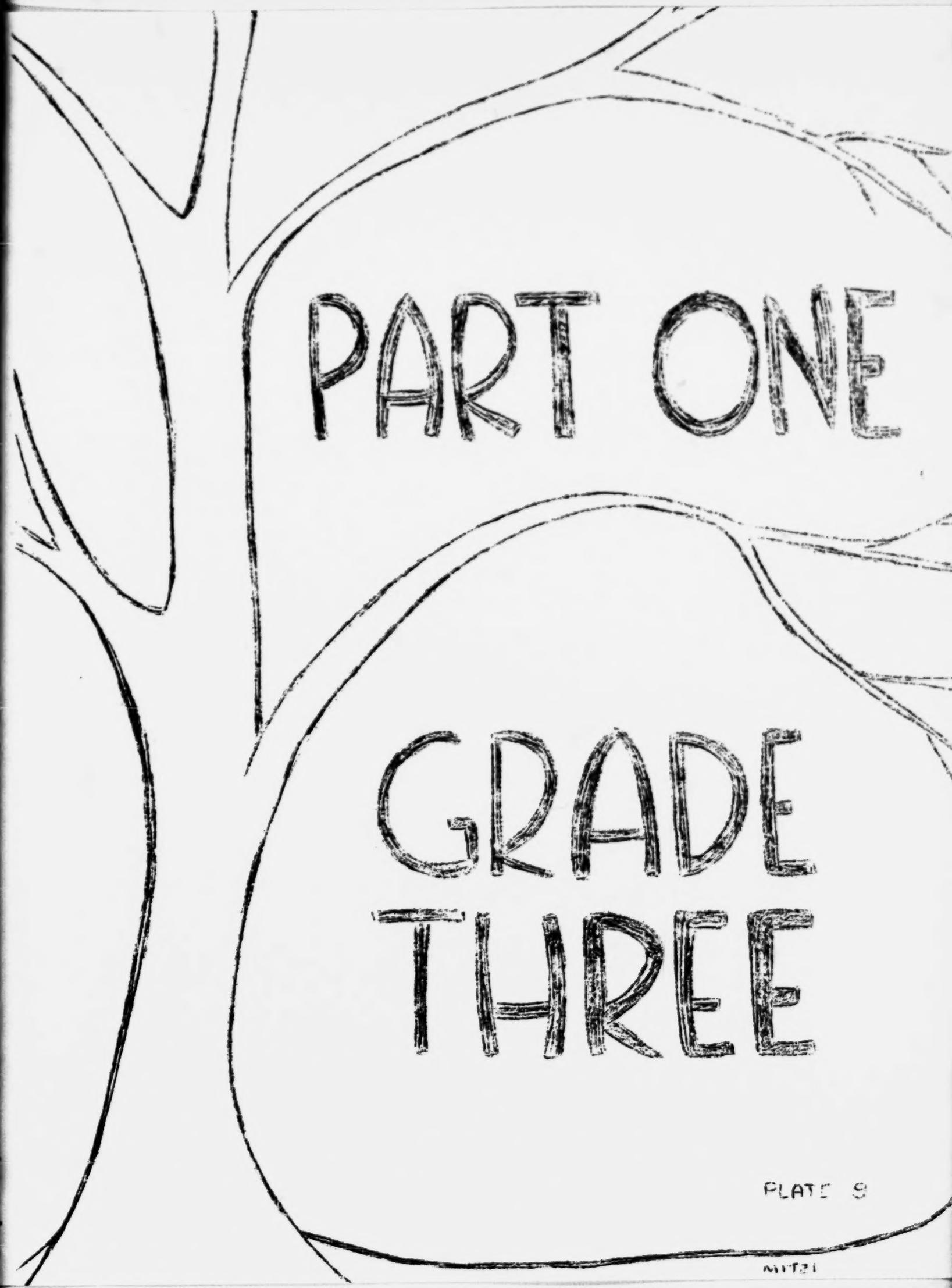
UNIT
III*
PLANTS

| | | | | |
|---|---|---|---|---|
| 18 | 1-simplest, non-green | 1-simplest, non-green | 1-non-green | 1-non-green |
| 19 | 1-simplest, green | 2 - 2nd simplest, green | 3-reproduction spores | 4-flowering |
| 20 | 4-function, seed | 4-function, stem | 4-evergreen | 4-function, flower |
| 21 | 4-function, root | 4-special adaptation | 4-function, leaf | interrelated-partners |
| 22 | interrelated-adaptation | interrelated-adaptation | interrelated-partners | interrelated-emergencies |

*For the sake of simplicity the naming of the groups are not consistent as to phylum, class, or order.

UNIT
IV
MATTER, ENERGY, MACHINES

| | | | | |
|---|---|---|---|---|
| 23 | matter-atom | matter-elements | matter-molecules | matter-water |
| 24 | poison | poison | no lesson | no lesson |
| 25 | science fair | science fair | matter-molecules | matter-changes |
| 26 | energy-magnets | energy-electricity | energy-electricity | energy |
| 27 | energy-electricity | energy-electricity | energy-electricity | energy-electricity |
| 28 | energy-light | energy-light | energy-light | energy-light |
| 29 | energy-sound | energy-sound | energy-sound | energy-sound |
| 30 | machines | machines | machines | machines |
| 31 | Mississippi | Mississippi | Mississippi | Mississippi |
| 32 | Evaluation | Evaluation | Evaluation | Evaluation |


PART ONE
GRADE THREE
PLATE 9
MITZI

# CONCEPTS IN SCIENCE

## PART ONE

## GRADE THREE

Introduction

General Concepts

Experiences

Lesson One
(Interrelated)

Concept: Living and non-living things differ.
Concept: Living things have certain requirements which non-living things do not possess.

## UNIT ONE

## LIVING THINGS

## ANIMALS

Introduction

Major Concepts

Experiences

Lesson Two

Concept: Proper care for the body leads to good health.

Lesson Three

Concept: Living things are in a constant change.
Concept: Animals such as the butterfly and the moth go through definite stages of development.
Concept: Animals that have like characteristics are grouped together.

Lesson Four

Concept: There are many kinds of animals that have jointed legs.

Lesson Five

Concept: There are many microscopic living things.
Concept: There are some animals whose bodies are cup-shaped with holes in their sides.

Lesson Six

Concept: Birds can be helpful.

Lesson Seven

Concept: The animals that are the highest in the class are the most highly developed.

Lesson Eight

Concept: Some animals make good pets.

Lesson Nine
(Interrelated)

Concept: Animals and plants live in different places and are useful to each other.

UNIT TWO

NON-LIVING THINGS

SPACE-EARTH

Introduction

Major Concepts

Experiences

Lesson Ten

Concept: The sun is the center of many revolving bodies.

Lesson Eleven

Concept: A great amount of information must be used to plan a trip to the moon.

Lesson Twelve

Concept: Many different instruments are used to collect weather information.

Lesson Thirteen
(Interrelated)

Concept: It is the responsibility of each person to learn the laws.

Lesson Fourteen

Concept: The earth as well as life upon it has changed as time has passed.

Lesson Fifteen

Concept: The earth is composed of the lithosphere, the hydrosphere, and the atmosphere.

Lesson Sixteen

Concept: The movement of the ocean waters change the surface of the earth below.

Lesson Seventeen
(Interrelated)

Concept: Studying the seashore and the life thereon helps us to understand the physical features and inhabitants.

UNIT THREE

LIVING THINGS

PLANTS

Introduction

Major Concepts

Experiences

Lesson Eighteen

Concept: All simple plants are not green.

Lesson Nineteen

Concept: There are hidden treasures in one-celled plants.

Lesson Twenty

Concept: The highest group of plants reproduce by means of seeds.

Lesson Twenty One

Concept: Roots of plants vary in function.

Lesson Twenty Two
(Interrelated)

Concept: Living things develop special means which enable them to survive and to deal with the problems they encounter.
Concept: Living things adapt themselves in numerous situations in order to survive.

## UNIT FOUR

## NON-LIVING THINGS

## MATTER-ENERGY-MACHINES

Introduction

Major Concepts

Experiences

Lesson Twenty Three

Concept: The atom is a particle of matter.

Lesson Twenty Four
(Interrelated)

Concept: An understanding of materials can prevent many poison accidents.

Lesson Twenty Five
(Interrelated)

Concept: Every student that takes part in a group activity gains knowledge.

Lesson Twenty Six

Concept: Like poles of a magnet repel and unlike poles attract.

Lesson Twenty Seven

Concept: Electricity has many characteristics.
Concept: Electricity and magnetism may be produced and used for many purposes.

Lesson Twenty Eight

Concept: Light passes through some objects, is reflected by others, and is absorbed by others.

Lesson Twenty Nine

Concept: Sound is produced by vibrating matter.

Lesson Thirty

Concept: Man uses machines to his advantage.

Lesson Thirty One
(Interrelated)

Concept: The mockingbird is the state bird of Mississippi.

Lesson Thirty Two
(Interrelated)

Concept: All aspects of science are related; a study of one field leads to an understanding of the other fields of science.

## LESSON ONE
## (Interrelated)

The child must become aware that everything in his surroundings are either living or non-living. The students may find it difficult to accept the fact that there are similarities as well as differences in living and non-living things.

This lesson will emphasize the differences in the living and non-living. A list of some of the differences will be mentioned with examples to better illustrate these differences.

We hope to develop a sense of curiosity in the student concerning his environment and the many activities that are constantly going on around him. Familiar experiences should be called to the attention of the student. The more experiences for the children the better understanding they will have of the arrangement in this world of the living and the non-living.

I. CONCEPTS

A. Living and non-living things differ.

B. Living things have certain requirements which non-living things do not possess.

II. OBJECTIVES

A. To stimulate curiosity about living and non-living things.

B. To show that living things change.

C. To realise that non-living things do not grow and develop as living things.

D. To develop an awareness that living things come from other living things.

E. To show that there is a purpose for the things that animals do.

F. To help the children develop an awareness that everything on earth is changing, including themselves.

G. All living things are either plants or animals.

H. There are two main groups of animals, vertebrates and invertebrates.

I. Living things are grouped according to likenesses.

III. PROBLEM:

To learn to arrange information so as to create a better order of study.

IV. INSTRUCTIONAL MATERIALS

A. Books

1. Exploring the Animal Kingdom, Millicent E. Selsam

2. How Things Grow, Herbert S. Zim

B. Films:

Living and Non-Living Things, Cor

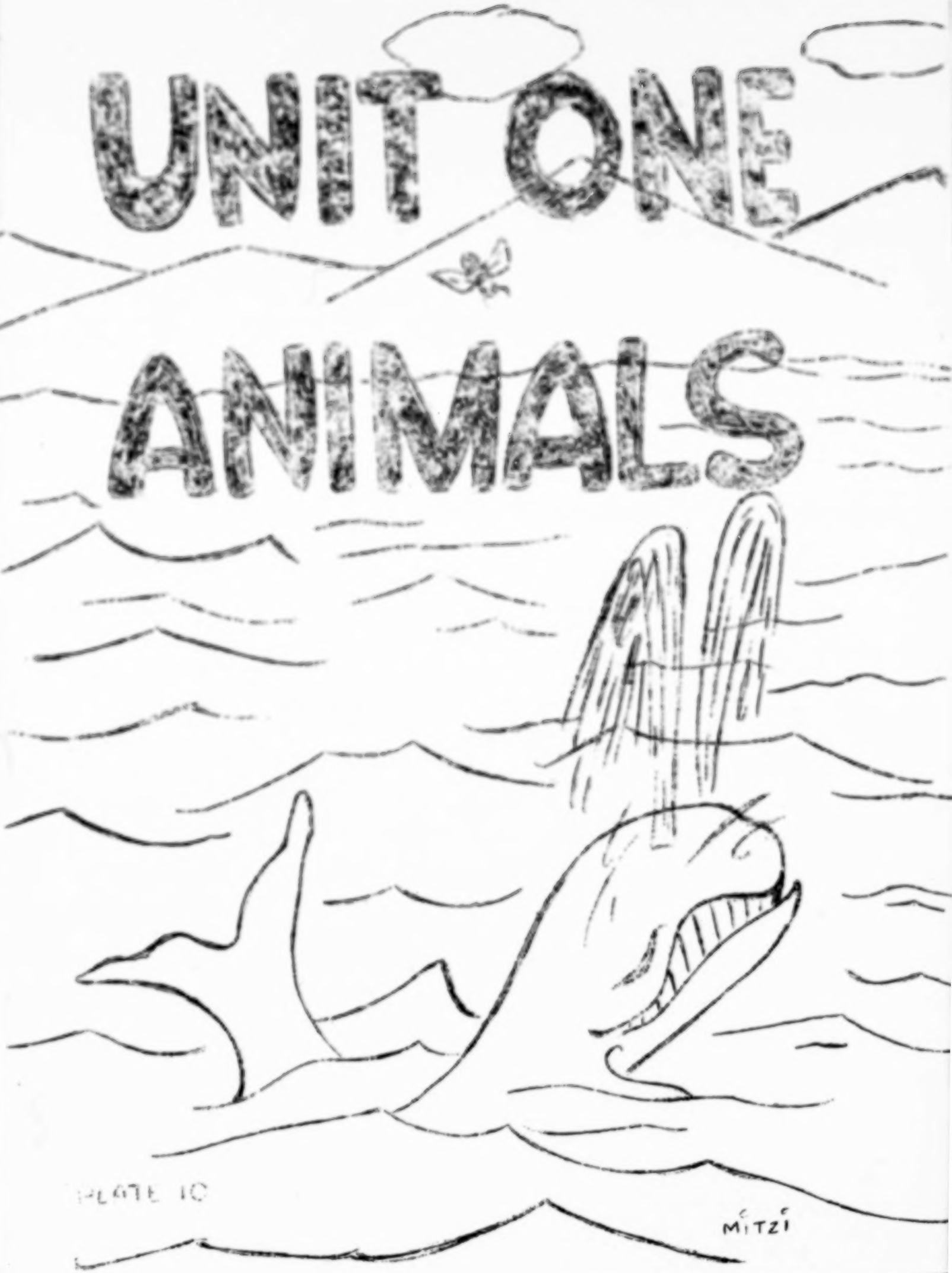
C. Filmstrips

1. How Animals Are Grouped, YAF

2. Living Things, SVE

# UNIT ONE

# ANIMALS



# UNIT ONE

## LIVING THINGS

## ANIMALS

### I

### Introduction

It is impossible to study animals separate from plants, for the interrelationships among them are extensive. Nevertheless, the major emphasis of this unit is placed on the animals as they fit into the web of life which they share with the plants. The dependence of animals upon plants is evident when an ecosystem is studied whether it be an aquarium, a pond, a forest, a major geographical region, or the Earth itself. The development of the concept of interrelatedness of living things is a major step forward for elementary school children in their understanding of order and balance in nature.

During the study of this unit the children are to be given opportunities to experiment with animals. They are to be encouraged to make accurate observations and comparisons. By so doing they should be able to interpret more effectively that which they see every day: animals, plants, and the physical environment.

## II

## Major Concepts

A. There are many different kinds of animals.

1. Animals vary in size.

2. Animals vary in shape.

3. Some animals are domesticated, others are wild.

4. Some animals produce valuable products for man.

5. Some animals which lived long ago are no longer living today.

6. We learn about the animals which lived long ago by studying fossils.

B. Animals need food, water, and air to live.

1. Animals eat different kinds of food and are dependent upon plants.

2. Animals get their food in a variety of ways.

3. Animals have structures which enable them to get food.

4. Animals have structures which enable them to get air.

5. Some animals gather and store food for use during the winter.

6. Man prepares for winter by storing food for himself and his animals.

7. Animals need fresh, clean water for survival.

C. Animals have different kinds of structures.

1. Some animals have wings for flying.

2. Some animals have special structures for obtaining food and for defending themselves: talons, claws, poison glands, etc.

3. Some animals are specially adapted for climbing, running, swimming, etc.

D. Animals have various means of protection.

1. Because of their color, some animals blend with their surroundings.

2. Some animals have well developed sense organs which permit them to detect an enemy at a distance: eyes, ears, nose.

3. Some animals are built for fast flight.

4. Some animals have protective structures: shells, claws, teeth, poison glands, odor glands, etc.

5. Animals have different kinds of body coverings.

E. Animals reproduce their own kind.

1. Some animals are born alive.

2. Some animals hatch from eggs.

3. All baby animals grow up to look like their parents.

4. Some baby animals do not look like their parents at first --- larval stages as illustrated by the frog and butterfly.

5. Some baby animals need the care of their parents, others can take care of themselves as soon as they are born or hatched.

F. Animals live in different places.

1. Some animals live in the water.

2. Some animals live on the land.

3. Some animals live in the soil.

4. Animals live in different parts of the world and have structures which enable them to live where they do.

    a. Deserts

    b. Swamps

    c. Forests

    d. Grassland

    e. Tropical regions

    f. Frigid regions

5. Some animals migrate from one home to another.

6. Some animals hibernate and estivate.

7. Some animals live together in groups or colonies.

## III

## Experiences

A. Lesson Two

1. Demonstrate the proper way to wash the hands.

2. Have students tell why it is important to wash hands before meals.

3. Set up a good grooming chart for students giving points for neat clothes, shoes, hair, etc., and clean fingernails, face, etc.

B. Lesson Three

1. Have the class make a collection of insects.

2. Give reasons why insects are helpful and harmful.

3. Show stages of a butterfly from egg to adult.

4. Study insect homes telling how each home is best suited to its particular insect.

C. Lesson Four

1. Discuss ways in which spiders are helpful and harmful.

2. Bring in pictures of different spiders and identify them.

3. Discuss the way a spider uses his web to catch food.

D. Lesson Five

1. Collect pond water and observe the animals in it. It may be necessary to observe some of the animals through a magnifying glass.

2. Collect soil and observe the animals in it. It may be necessary to observe some of the animals through a magnifying glass.

3. Find out as many ways of movement as you can.

4. Name the special adaptations of the animals for the different movements.

E. Lesson Six

1. Build a feeding station for the birds outside the schoolroom.

2. Discover what birds eat in summer and winter.

3. Discover how birds migrate for the winter.

4. Have students identify pictures of birds.

5. Discuss how birds help farmers.

6. Discuss how baby birds learn to fly.

F. Lesson Seven

1. Plan displays and bulletin boards showing mammals in various habitats such as the ocean, pond, meadow, mountain, and woods.

2. Play a game "Name the Animal." Let the children give a description of the animal they have in mind and the other students identify it.

3. Talk about animals that are sometimes harmful in some ways and helpful in other ways.

4. Visit a farm.

G. Lesson Eight

1. Let the children make a picture book of different kinds of animals.

2. Let each child tell about his favorite animal.

3. Make flannel cut-outs of different animals to accompany animal songs which they will sing.

4. Ask the children to read animal stories.

5. Set up a cage in the classroom with an animal in it. Have the students observe the eating habits and movements. Weigh the pet from time to time. (rabbit or guinea pig)

6. It would be interesting to have a pet hamster or turtle in the classroom to observe other animal habits.

7. Instruct the children to bring into the classroom any caterpillar they find. Discuss where it was found, the food and proper care it will need. Let the students observe it each day.

8. Decorate the room with all kinds of animal pictures in some order.

9. Have the students make a poster with pictures of animals that move in different ways.

10. Take the children to a pet shop or zoo and observe the different kinds of animals.

11. Have the children observe the different animals in the neighborhood and report to the class.

12. Visit an animal hospital.

H. Lesson Nine

1. Set up an aquarium in the classroom.

2. List plants that should be put in an aquarium and tell reasons for having the plants.

3. Observe the snail and discuss its use in the aquarium.

4. Find the proper food and amount of food the fish need, and let students take turns feeding them.

## LESSON TWO

I. CONCEPT:

Proper care for the body leads to good health.

II. OBJECTIVES

A. To cause the student to become conscious of the need for daily personal care.

B. To help the student to develop a proper routine for personal cleanliness.

C. To learn the proper way to wash your hands.

D. To learn good developing exercises for the hands.

III. PROBLEM:

To learn some basic rules for personal cleanliness.

IV. INSTRUCTIONAL MATERIALS

A. Books
1. All About the Human Body, Bernard Glemser
2. The Human Body, Cyril and Morison Bibby
3. How Your Body Works, Herman and Nina Schneider
4. The Wonders Inside You, Margaret L. Cosgrove
5. Wonders of the Human Body, Anthony Ravelli
6. What's Inside of Me?, Herbert S. Zim
7. How Things Grow, Herbert S. Zim
8. What Makes Me Tick, Hyman Ruchlis
9. The True Book of Health, Olive V. Haynes

B. Films:
Learning About Out Bodies, EBF

C. Filmstrips
1. How Animals Are Grouped, YAF
2. Living Things, SVE

## LESSON THREE

I. CONCEPTS

A. Living things are in a constant change.

B. Animals such as the butterfly and the moth go through definite stages of development.

C. Animals that have like characteristics are grouped together.

II. OBJECTIVES

A. To realize that there are more than a million different kinds of insects.

B. To develop an understanding of this group of animals with jointed legs.

C. To become aware of the reasons all insects are grouped together.

D. To know that such animals as the butterfly and moth go through definite stages of development.

E. To show what effect the environment has upon the insect.

F. To develop an appreciation for the continuation of life.

III. PROBLEM:

To find out why a butterfly is an insect.

IV. INSTRUCTIONAL MATERIALS

A. Books

1. Insects on Parade, Clarence J. Hylander
2. The Wonder World of Insects, Marie Neurath
3. Catch a Cricket, Carla Stevens
4. Collecting Cocoons, Lois and Catherine Hussey
5. I Like Butterflies, Gladys Conklin
6. Tiger: The Story of a Swallowtail Butterfly, Robert McClung

7. Let's Go for a Nature Walk, Joan Rosner
8. The True Book of Insects, Illa Podendorf
9. Insects and the Homes They Build, Dorothy Sterling
10. Crickets, Olive Earkhem
11. Insects and Their World, Carroll L. Fenton
    Dorothy C. Pallas
12. Animals That Live Together, Bertha Morris Perker
13. The True Book of Animal Homes, Illa Podendorf

B. Films
1. Silk, EBF
2. How Insects Help Us, Cor
3. The Monarch Butterfly Story, EBF

C. Filmstrips
1. Butterflies Grow, JH
2. Insects Get Ready for Winter, JH
3. Butterflies and Moths, SVE

## LESSON FOUR

I. CONCEPT:

There are many kinds of animals that have jointed legs.

II. OBJECTIVES

A. To develop an understanding of the animals with jointed legs.

B. To understand that there are animals other than insects that have jointed legs.

C. To realize some animals are more helpful than harmful.

D. To understand how animals are adapted to certain ways of living.

E. To develop an awareness for the continuation of life.

F. To become observant of life processes around us.

G. To become aware that there are many things of interest around us.

III. PROBLEM:

To learn more of animals with jointed legs.

IV. INSTRUCTIONAL MATERIALS

A. Books
1. Spiders, Dorothy C. Hogner
2. Garden Spider, Mary Adrian
3. Nature Games and Activities, Sylvia Cassell
4. Spiders, Bertha M. Parker

B. Films
1. A Typical Garden Spider, Cor
2. Spiders, EBF

## LESSON FIVE

I. CONCEPTS

A. There are many microscopic living things.

B. There are some animals whose bodies are cup-shaped with holes in the sides.

II. OBJECTIVES

A. To develop an awareness of some of the characteristics of microscopic animals.

B. To learn some of the various microscopic animals.

C. To learn the habitats of simple animals.

D. To understand that some simple animals are helpful while others are harmful.

E. To develop an understanding that all living things are made up of cells.

F. To learn how to use a magnifying lens.

III. PROBLEM:

To learn about the smallest animals.

IV. INSTRUCTIONAL MATERIALS

A. Books

1. Life Under a Microscope, William H. Hutchison
2. First Book of Microbes, Lucia Z. Lewis
3. Magic Lens, Frances Rogers
4. The Story of Microbes, Albert Schatz and Sarah Reidman
5. Through the Magnifying Glass, Julius Schwartz
6. Microbes at Work, Millicent Selsam
7. Men, Microscopes, and Living Things, Katherine Shippen

B. Films
   1. Life in a Drop of Water, Cor
   2. Microscopic Animal Life, EBF
   3. Protozoa, EBF
   4. How Animals Are Classified, JH
   5. Simple Animals, JH

C. Filmstrips
   1. Small Fresh-Water Animals and Insects, JH
   2. Through the Microscope, PS

## LESSON SIX

I. CONCEPT:

Birds can be helpful.

II. OBJECTIVES

A. To form a better understanding of how birds help man.

B. To become aware of the fact that birds must be protected because they are man's friend.

C. To develop an appreciation for our local birds.

III. PROBLEM:

To understand why birds are more helpful than harmful.

IV. INSTRUCTIONAL MATERIALS

A. Books

1. Wonders of the Bird World, Helen Cruikshank
2. Birds and Their Nests, Olive L. Earle
3. Robins on the Window Sill, Irmengarde Eberle
4. The True Book of Birds We Know, Margaret Friskey
5. City Birds, Lucy and John Hawkinson
6. The Bird Watchers, Marjory B. Sanger
7. Roof For a Birds Nest, Robert Scharff
8. The Amazing Book of Birds, Hilda Simon
9. First Book of Birds, Margaret Williamson
10. Hop, Skip, and Fly, Irmengarde Eberle
11. All About Eggs, Millicent E. Selsam
12. Birds, Herbert S. Zim and Ira N. Gabrielson
13. Migration of Birds, Frederick C. Lincoln
14. Giant Little Golden Book of Birds, Hane Werner
15. Penguins, Louis Darling
16. Birds and Planes, How They Fly, John Lewellen
17. Bobwhite From Egg to Chick to Egg, Elizabeth and Charles Schwartz
18. Birds and Their World, Carroll L. Fenton and Dorothy C. Pallas

B. Films

1. Birds of the Countryside, Cor
2. Birds of the Dooryard, Cor
3. Birds of the Woodlands, Cor
4. Mr. and Mrs. Robin's Family, Cor
5. Flight of the Sea Birds, WLF
6. Robin Redbreast, EBF
7. Birds of Prey, EBF
8. The Bobolink and Blue Jay, Cor
9. Birds in Winter, Cor
10. The Red-Winged Blackbird, Cor
11. High Over the Borders
12. Water Birds, EBF

C. Filmstrips

1. Adaptation of Birds, JH
2. The Structure of Birds, JH
3. How To Recognize Birds, SVE
4. Birds Get Ready for Winter, JH
5. Homes of Birds, SVE
6. The Migration of Birds, SVE
7. Audubon's Birds of America, EBF

LESSON SEVEN

I. CONCEPT:

The animals that are the highest in the class are the most highly developed.

II. OBJECTIVES

A. To better understand the characteristics of mammals.

B. To develop an awareness of the many varied mammals.

C. To understand that mammals are adapted to all kinds of habitats.

III. PROBLEM:

To learn to know how to recognize a mammal.

IV. INSTRUCTIONAL MATERIALS

A. Books
1. The First Book of Mammals, Margaret Williamson
2. The Great Whales, Herbert S. Zim
3. Animals That Help Us, Herminie G. Kitchen and Carroll L. Fenton
4. The Wonder World of Animals, Marie Neurath
5. Here Come the Whales!!, Alice E. Goudy
6. All About Whales, Roy C. Andrews
7. The First Five Fathoms, Arthur C. Clark

B. Films:
Animals with Backbones, Cor

C. Filmstrips
1. How Animals Are Classified, JH
2. Mammals, JH

## LESSON EIGHT

I. CONCEPT:

Some animals make good pets.

II. OBJECTIVES

A. To learn which animals are usually used for pets.

B. To enable the student to learn the proper care of some pets.

C. To encourage love and care for animals.

D. To permit the child to learn responsibility in caring for an animal.

III. PROBLEM:

To learn to care for a pet properly.

IV. INSTRUCTIONAL MATERIALS

A. Books
1. A Pet Book, Barton
2. The Pet Show, Glenn O. Bloush
3. My Own Little Cat, Gerland Ekeroth
4. The Pet Club Masters, Katherine W. Masters

B. Films:
Familiar Animals and Their Families, SVE

C. Filmstrips
1. Mama Cat's Babies, Curr F
2. The Curious Kitten, Curr F
3. The Lost Hamster, Curr F
4. Andy's Raccoon, Curr F
5. Too Many Pets, Curr F

LESSON NINE
(Interrelated)

I. CONCEPT:

Animals and plants live in many different places and are useful to one another.

II. OBJECTIVES

A. To develop an observing attitude and curiosity about living things.

B. To provide the children with learning experiences they will not soon forget.

C. To give a greater understanding of how living things are interdependent with one another and with their environment.

III. PROBLEM:

To learn to set up an aquarium for your home.

IV. INSTRUCTIONAL MATERIALS

A. Books
1. An Aquarium Book for Boys and Girls, Alfred Morgan
2. The True Book of Tropical Fishes, Ray Broekel
3. First Book of Ponds and Streams, Ann Morgan

B. Films
1. A Fish Family, MIS
2. Aquarium Wonderland, PDP
3. Life in an Aquarium, YAF

C. Filmstrips
1. The Aquarium, YAF
2. Keeping an Aquarium, JH
3. Life in an Aquarium, YAF

# UNIT TWO

# SPACE AND EARTH

© MITZI ©

PLATE 11

# UNIT TWO

## NON-LIVING THINGS

## SPACE-EARTH

### I

### Introduction

We begin our study with the sun since it is the center of our solar system. The sun was selected as a beginning to space study because we are a part of it and from the sun we get the energy that sustains life.

From the solar system, one heavenly body was selected to study in more detail. The moon study is timely and interesting. In our scientific society space explorations are an interesting topic. By studying about the moon, the students will have a better idea of how space explorations will affect our lives. This study gives an idea of the vastness of space.

Weather is an important part of our lives. Common day by day changes can be noted from the classroom. Weather charts may be kept. They create interest as the students work with them day after day. The children learn if these observations are extended. This time of year should provide definite weather changes.

As we near the holiday season our minds turn to joyous thoughts. To help these thoughts to continue, a program concerning safety is planned at this time. It includes a wide variety of safety practices as well as the law concerning gifts that might be received. This study should cause a consciousness of the safety factor and a consideration and respect for law and law officers.

Scientists have been able to put together information that tells us about life on the earth millions of years ago. The earth story has been learned from studying the earth and its contents. Studying pre-historic life and the changes in the earth is an exciting experience for the students.

The study of the early earth is followed by the changes that occur under the waters off shore. This brings the study of the heavens and the earth together because the tides influence the changing surface. The tides and the ocean influence the lives of many ocean plants and animals. Here, the children can see the relationship between the earth, the moon and the sun as well as the plants and the animals.

Concluding with life on the seashore brings us from far in space through the atmosphere to the earth and the waters of the earth. The seashore is influenced by all these factors.

## II

## Major Concepts

A. The sun is a part of our solar system.

1. Light from the sun reflects from the moon.
2. The sun is a star of medium size.
3. The sun is the center of the solar system.
4. The earth's energy comes from the sun.
5. The sun is a luminous body.
6. Many bodies are included in our solar system.
7. The solar system is located in the milky way.
8. The sun shines all the time.

B. The moon is a part of our solar system.

1. Man is changing his ideas about the moon.
2. Many preparations must be made before visiting the moon.
3. The further away some object is the smaller it appears.
4. The phases of the moon are caused by the moon moving around the earth.

C. Changes in the air around us cause weather.

1. All energy needed to cause the changes in weather come from the sun.
2. The kinds of weather we have are caused by the kinds of air masses over an area.
3. Everything living is affected by the weather.
4. To survive, all living things must adapt to the weather changes.

5. Weather refers to the conditions of the atmosphere.

D. Laws are made for the well-being of many people.

1. Laws must be observed.

2. Safety measures must be followed to prevent accidents.

3. Legends concerning plants and animals for the holiday season are interesting.

E. The earth is a planet in the solar system.

1. The earth is constantly rotating on its axis and revolving around the sun.

2. Plant and animal life has existed on the earth for millions of years.

3. Three-fourths of the earth is covered with water.

4. The earth is constantly changing.

F. Life along the seashore differs from life in other communities.

1. Special adaptations are necessary to live on the seashore.

2. Tides affect the seashore as well as the life there in.

3. There are numerous dwellers of the sand.

G. The oceanfloor is constantly changing.

1. There are defenses against the waves.

2. The seashore changes with the tide.

3. The shore line changes.

4. There are irregularities under the ocean floor.

5. Plants and animals live in many different places and are useful to each other and to man.

## III

## Experiences

A. Lesson Ten

1. Find out at what time the sun rises and sets each day.
2. Illustrate the role the sun plays in the water cycle.
3. Trace the energy from the sun to you.
4. Illustrate the earth and the sun by using a string with an attached object and turning rapidly.
5. Have a discussion of Halley's comet.
6. Illustrate the making of a crater by dropping an object in sand.

B. Lesson Eleven

1. Have the children find out if any other objects in the sky reflect light.
2. Use a calendar that shows the moon phases and relate these to the earth and sun at that time.
3. Draw the relative positions of the sun, the moon, and the earth for the present day.
4. Investigate the time of rising and setting of the moon.
5. Illustrate the ellipse of the moon with models.
6. Illustrate the phases of the moon.
7. Ask the students to bring in recent articles concerning the moon.
8. Ask the class to draw pictures illustrating moon craters.
9. Have the students build models of craters and rays from sand and clay.

10. Bring in pictures of the moon terrain.

C. Lesson Twelve

1. List the different kinds of weather you have had in the last week.

2. Visit the Natchez Trace Headquarters to observe the weather station. Contact the Chief Ranger for visiting arrangements.

3. Visit the U. S. Weather Bureau in Tupelo. Contact Miss Mary Dean Akers, 842-8400 (daytime), for arrangements.

4. Make some weather instruments.

5. Ask the students to compare their readings with the radio, television, or newspaper.

D. Lesson Thirteen

1. Visit the Police Department in your area.

2. Make a list of safety precautions you can follow at school, home, etc.

3. Study the scientific principles of some toy.

E. Lesson Fourteen

1. Permit the students to bring in models of dinosaurs.

2. Visit a museum or fossil collection.

3. Bring in reports of fossils found nearby.

F. Lesson Fifteen

1. Let the children locate on a globe where they live.

2. Have the children collect pictures of the irregularities on the surface of earth.

3. Collect pictures of different countries. Discuss the differences in the regularity of the land.

4. Let the children make models of valleys, mountains, etc., on a sand table.

5. After a rain, let the children observe the changes made by the running water.

6. Search out roots growing to illustrate their effect upon erosion.

7. Fill a metal container with water. Place it in a refrigerator. After it is frozen, show it to the children and illustrate the principle of an iceberg.

8. Visit areas that have eroded by different means.

9. Drop objects at the same time to illustrate the effect of gravity on them.

10. Begin a rock collection.

G. Lesson Sixteen

1. Locate the Continental Shelf on a map.

2. List plants and animals that might be found on the Continental Shelf.

3. Have students find out how far the Continental Shelf extends from the coast line of the United States.

H. Lesson Seventeen

1. Have students study the adaptations necessary for alternating periods of being submerged in salt water and being exposed to the atmosphere.

2. Collect shells from the seashore.

3. Learn why the sea is salty.

4. Have a display of minerals from the sea.

5. Classify the animals and plants in some order.

6. Collect pictures of sea animals off shore that are useful to man.

## LESSON TEN

I. CONCEPT:

The sun is the center of many revolving bodies.

II. OBJECTIVES

A. To learn that the earth is a part of the solar system.

B. To be aware that the sun sends out energy in the form of waves.

C. To understand that rays from the sun are changed to heat on striking the earth.

D. To realize that all living things depend upon the energy from the sun.

E. To be aware that storms on the sun affect our communications.

F. To learn that the sun is made up of hot gases.

G. To develop an awareness of the many movements of our solar system.

H. To stimulate curiosity about the solar system.

III. PROBLEM:

To learn the relationship of the sun and the earth.

IV. INSTRUCTIONAL MATERIALS

A. Books

1. Go With the Sun, Mirian Schlein
2. Follow the Sunset, Herman and Nina Schneider
3. How the Sun Helps Us, Glenn Blough and Ids DePencier
4. Star of Wonder, Robert Coles and Frances Frost
5. The Moon, Sun, and Stars, John Lewellen
6. Our Sun and the World Around Us, Jane Lyon
7. The Sun, Herbert S. Zim

8. Sun, Earth, and Man, George P. Bischof and Eunice F. Bischof
9. How Big Is Big?, Herman and Nina Schneider
10. A Child's Book of Stars, Sy Barkow
11. Thank You, Mr. Sun, Hyman Ruchlis

B. Films
1. Sun and How It Affects Us, Cor
2. Water Cycle, PDP
3. Sun, Earth, and the Moon, ALF
4. The Sun's Family, YAF

C. Filmstrips
1. A Multitude of Suns, JH
2. The Sun and Its Planets, SVE
3. The Solar System, YAF
4. What Are Stars?, YAF
5. The Sun and Its Planets, SVE

## LESSON ELEVEN

I. CONCEPT:

A great amount of information must be used to plan a trip to the moon

II. OBJECTIVES

A. To learn that astronomy is a study of the heavenly bodies.

B. To have an awareness of the layers in the atmosphere.

C. To have an awareness that gravity holds us to the earth.

D. To understand that special clothing must be worn to visit outerspace.

E. To understand that we must plan for a re-entry to the earth's atmosphere.

F. To have knowledge concerning the moon that is used to plan a trip into outerspace.

III. PROBLEM:

To find out if there are footprints on the moon.

IV. INSTRUCTIONAL MATERIALS

A. Books

1. The Moon Is a Crystal Ball, Natalie Belting
2. Rockets Into Space, Alexander L. Crosby
3. A Book To Begin on Outer Space, Eunice Holseart
4. Off Into Space, M.O. Hyde
5. Speeding Through Space, Marie Neurath
6. By Space Ship to the Moon, Jack Coggins and Fletcher Pratt
7. Fun with Astronomy, Mae and Ira Freeman
8. Rocket Away!, Frances Frost
9. True Book of Moon, Sun, and Stars, John Lewellen
10. Exploring Space, Rose Wyler

11. The First Book of Space Travel, Jeanne Bendick
12. You and Space Travel, John Lewellen
13. This Is the Moon, Marion Cothren
14. Exploring the Moon, Roy A. Gallant
15. Moon Trip, William Nephew and Michael Chester

B. Films
1. This Is the Moon, YAF
2. Trip to the Moon, EBF
3. Understanding Our Universe, Cor
4. The Moon, EBF

C. Filmstrips
1. First Adventure in Space, JH
2. The Moon, YAF
3. Flight Around the Moon, EBF
4. The Moon - Our Earth's Nearest Neighbor, YAF

## LESSON TWELVE

I. CONCEPT:

Many different instruments are used to collect weather information.

II. OBJECTIVES

A. To understand that meteorologists study the weather.

B. To become aware that many instruments are needed to collect weather information.

C. To learn to use the barometers to measure air pressure.

D. To learn about the snow and rain gauges to measure precipitation.

E. To know that the anemometers measure wind speed.

F. To learn how the hygrometers and psychrometers measure relative humidity.

G. To be aware that the purpose of wind socks is to show the direction of the wind.

III. PROBLEM:

To learn about the instruments that are used to record the weather.

IV. INSTRUCTIONAL MATERIALS

A. Books

1. Let's Go to a Weather Station, Louis Wolfe
2. Air, Irvin and Ruth Adler
3. The First Book of Air, David Knight
4. The True Book of Air Around Us, Margaret Friskey
5. What Does a Barometer Do?, William Courtney
6. The First Book of Weather, Rose Wyler
7. Weather in Your Life, Irvin Adler

8. Junior Science Book of Weather Experiments, Focco Feravolo
9. Weather, Paul E. Lehr
10. Worlds in the Sky, Carroll Fenton and Mildred Adams Fenton
11. This Way to the Stars, John M. Schealer
12. You Among the Stars, Herman and Nina Schneider
13. Weathercraft, Athelstan F. Spilhaus

B. Films
1. What Makes Rain?, Cor
2. How Weather Is Forecast, Cor
3. Measuring Temperature, YAF
4. Measuring Temperature, PDP

C. Filmstrips
1. The Thermometer, YAF
2. Weather Wizards, (TFC)
3. A Trip to the Weather Station, YAF
4. Be Your Own Weatherman, Curr F

LESSON THIRTEEN
(Interrelated)

I. CONCEPTS

A. It is the responsibility of each person to learn the laws.

B. Many items of scientific interest will be observed during the holidays.

II. OBJECTIVES

A. To develop proper attitudes toward laws and law officers.

B. To become aware of some laws that are most obvious at Christmas time.

C. To learn to be thoughtful of the safety of your fellowmen.

D. To let your knowledge aid you in enjoying the full significance of the holidays.

III. PROBLEM:

To help others have a Merry Christmas.

IV. INSTRUCTIONAL MATERIALS

A. Books
1. First Book of Firemen, Bill and Rosalie Brown
2. The Forest Firemen, Bill and Rosalie Brown
3. Fire in Your Life, Irving Adler
4. Fire, Bertha Parker
5. Watch Your Step, J. J. Floherty

B. Films
1. Fire, EGF
2. We Make A Fire, IF
3. Understanding Fire, Cor

C. Filmstrips
1. Preventing and Controlling Fire, YAF
2. Story of Fire, YAF

## LESSON FOURTEEN

I. CONCEPT:

The earth as well as the life upon it has changed as time has passed.

II. OBJECTIVES

A. To better understand that there are large divisions of time.

B. To develop an understanding of the age of the earth.

C. To learn the different kinds of life that lived in different eras.

D. To develop an appreciation of the scientific method by which scientists have been able to find out about conditions on the earth in pre-historic times.

E. To develop an understanding of how plants and animals of times past have become extinct.

F. To obtain a better understanding of the lands of the earth in pre-historic times.

III. PROBLEM:

To learn of some of the animals like that which lived in pre-historic times.

IV. INSTRUCTIONAL MATERIALS

A. Books

1. Dinosaurs, Marie Halun Bloch
2. Discovering Dinosaurs, Glenn Blough
3. The True Book of Dinosaurs, Mary Lou Clark
4. A Child's Book of Prehistoric Animals, Bruno Frost
5. A Book to Begin on Dinosaurs, Eunice Holseart
6. First Days of the World, Gerald Ames and Rose Wyker

7. The First People in the World, Gerald Ames and Rose Wyker
8. All About Strange Beasts of the Past, Roy C. Andrews
9. The First Book of Prehistoric Animals, Alice Doclomspm
10. The First Book of Archeology, Nora Kubie
11. Ancient Elephants, William Schelle
12. The Age of Reptiles, Dorothy Shuttleworth
13. The Real Book About Prehistoric Life, Dorothy Shuttleworth
14. Prehistoric America, Anne T. White
15. The Last Mammoth, Manaly W. Wellman

B. Films
1. Animals of Long Ago, Curr F
2. Fossils: Clues to Prehistoric Times, Cor
3. A World is Born, WD
4. Animals of Long Ago, Curr F

C. Filmstrips
1. Discovering Fossils, EBF
2. The Rise of the Dinosaurs, EBF
3. The Story Fossils Tell, EBF
4. Triumph of the Dinosaurs, EBF
5. Prehistoric Life, EBF
6. Dinosaur Age, FAC

## LESSON FIFTEEN

I. CONCEPT:

The earth is composed of the lithosphere, the hydrosphere, and the atmosphere.

II. OBJECTIVES

A. To show that the earth is spherical.

B. To be aware that from outer space the earth appears smooth.

C. To develop an awareness that the surface of the earth is always changing.

D. To show that all bodies in the universe attract one another with a force called gravitational attraction.

E. To be aware that there is heat inside the earth.

F. To emphasize that many facts about the earth can be learned by studying the rocks.

G. To show that the hard part of the earth is rock.

III. PROBLEM:

To learn to name the different divisions of the earth.

IV. INSTRUCTIONAL MATERIALS

A. Books

1. The First Book of Stones, Maribelle Cormack
2. Rocks, Rivers, and the Changing Earth, Herman and Nina Schneider
3. Man and the Good Earth, Ellis A. Williams
4. The First Book of the Earth, Irene Sevrrey
5. What's Inside the Earth?, Herbert Zim
6. The Land We Live On, Mildred A. and Carroll L. Fenton
7. The Earth Satellite, John B. Lewellen
8. Our Wonderful Earth, Herbert Townsend

9. The True Book of Conservation, Richard Gates
10. The Earth's Crust, Boleslaus John Syrocke
11. What is a Rock?, Boleslaus John Syrocke

B. Films
1. This Vital Earth, EBF
2. A World Is Born, WD
3. Planet Earth, AVED Productions
4. Our Big, Round World, Cor
5. Your Friend, the Soil, EBF
6. What Is Soil?, Cor

C. Filmstrips
1. Our Home, the Earth, SVE
2. The Soil, JH
3. The Earth, EBF
4. How Our Earth Began, Curr F
5. The Changing Surface of the Earth, YAF
6. Our Earth Series: How We Think Our Earth Came To Be, JH
7. Earth is Changing, JH
8. Our Earth Is Moving, Curr F

## LESSON SIXTEEN

I. CONCEPT:

The movement of the ocean waters changes the surface of the earth below.

II. OBJECTIVES

A. To stimulate curiosity about off shore formations.

B. To become aware that some plants and animals have off shore habitats.

C. To show there is an interrelation of plants and animals in the shallow sea.

D. To learn that everywhere under the land and the sea, there is solid rock.

III. PROBLEM:

To discover that the land under the ocean is not always level.

IV. INSTRUCTIONAL MATERIALS

A. Books
1. What Happens in the Sea?, Ray Bethers
2. The First Book of Sea Shells, Betty Cavanna
3. The Adventure Book of Shells, Eva K. Evans
4. Houses From the Sea, Alice E. Goudy
5. Let's Go To the Seashore, Harriet Huntington
6. Sea Treasure: A Guide to Shell Collecting, Kathleen Yerger Johnstone
7. All About the Sea, F. C. Lane
8. At Water's Edge, Terry Shannon

B. Films
1. Water, Water, Everywhere, Cor
2. We Explore the Beach, Cor
3. We Visit the Seashore, YAF

C. Filmstrips
1. Animal Environments, Curr F
2. American Seashores, YAF

## LESSON SEVENTEEN
(Interrelated)

I. CONCEPT:

Studying the seashore and life thereon helps us to understand its physical features and inhabitants.

II. OBJECTIVES

A. To further the understanding of the students of the kinds of life found on the seashore.

B. To develop an awareness of the changes on the seashore line.

C. To emphasize the interrelation of life upon the seashore.

D. To realize that the life in the tides differs.

E. To create interest of the seashore.

III. PROBLEM:

To learn the names of several plants and animals that live on the seashore.

IV. INSTRUCTIONAL MATERIALS

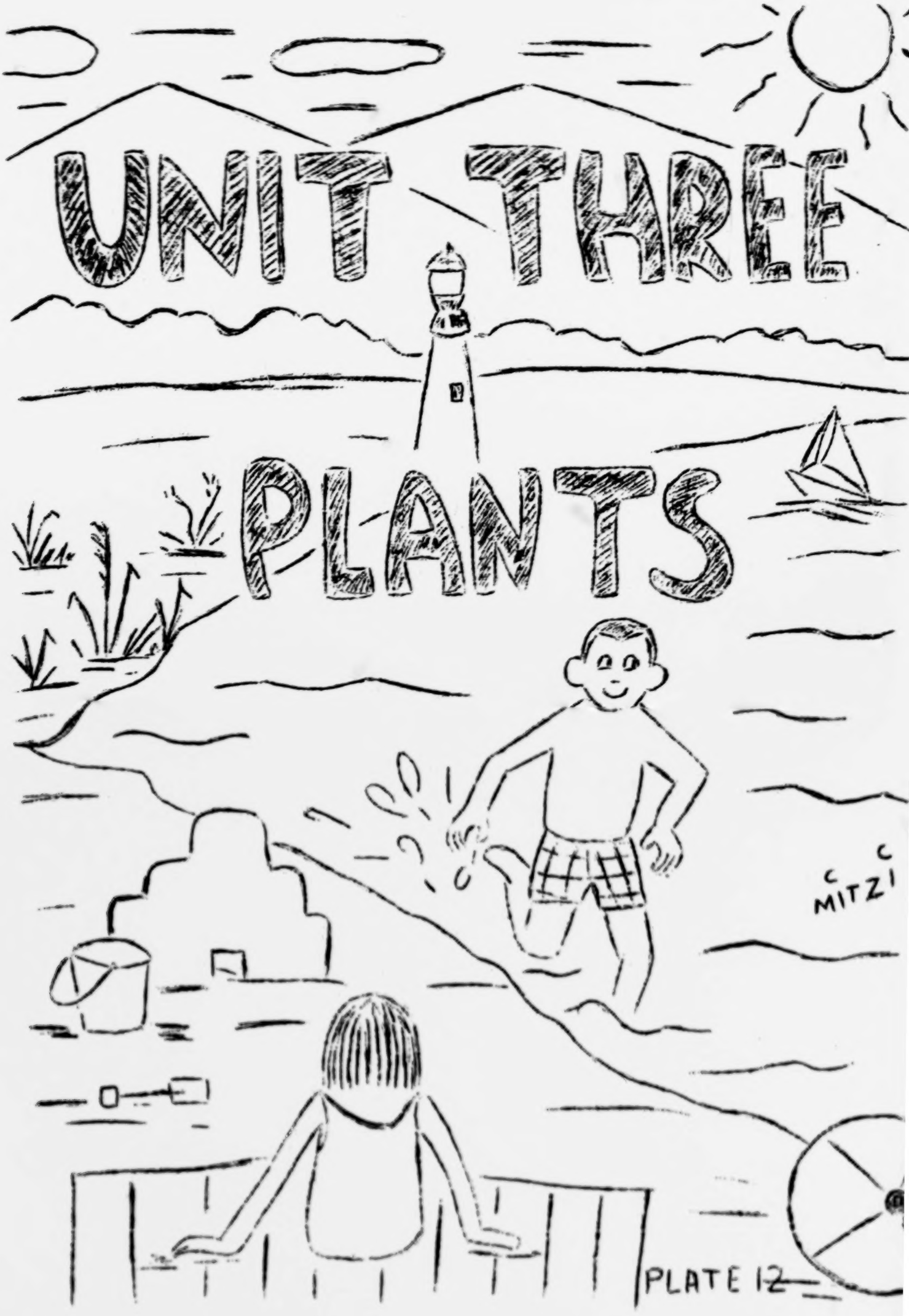
A. Books

1. Wonders of the Seashore, Jacquelyn Berrill
2. First Book of Sea Shells, Betty Cavanna
3. Sea Shells, Ruth H. Dudley
4. The Real Book About the Sea, Samuel Epstein and Beryl Williams
5. At Water's Edge, Terry Shannon
6. Beginner's Guide to Seashore Life, Leon Hausman
7. Sea and Shore, Clarence J. Hylander
8. Wild Folk in the Woods, Carroll Fenton
9. The Adventure Books of Shells, Eva K. Evans
10. Houses from the Sea, Alice Goudy
11. Let's Go To The Seashore, Harriet Huntington

12. Sea Treasures: A Guide to Shell Collecting, Kathleen Yerger Johnston
13. True Book of Pebbles and Shells, Illa Podendorf

B. Films
1. Seashore Life, EBF
2. Beach and Sea Animals, EBF
3. Tide Pool Life, EBF
4. Understanding Oceanography, SVE

C. Filmstrips:
Shellfish of the Seashore, JH


UNIT THREE
PLANTS
©MITZI©
PLATE 12

# UNIT THREE

# LIVING THINGS

# PLANTS

## I

## Introduction

Children's curiosity about plants in their environment can be stimulated by studying the simpler plants first, the green and non-green plants, then advancing to the more difficult ones. This study introduces them to the factors necessary for all plants to live, move, grow, secure food, reproduce and respond to stimuli. The purpose of plants as a food producer can vividly emphasize the need to learn about them. The unusual arrangements that plants have of meeting their needs will be found to be interesting. The emphasis is on the life science called botany. The plant kingdom is every bit as exciting as the animal kingdom.

The students will be aware of the divisions of plants by their characteristics and the basic parts of plants and their function.

A study of the seed is chosen because of the interest and ease of illustrating seeds and their germination. The root is undertaken as a study to familiarize the student with the functions of one part of a plant. Other parts will follow in future years.

The last lesson emphasizes that plants and animals are dependent on their ability to adapt to their environment. The lesson will progress from the common to the more unusual.

## II

## Major Concepts

A. All non-green plants depend directly or indirectly upon green plants for food.

   1. Some fungi are poisonous while others are used as food for man.

   2. Algae could be a source of food for man in the future.

   3. Reproduction is one of the most important features of living things.

   4. All living things grow as cells grow and divide.

B. Plants are living organisms.

   1. Green plants use energy from the sun to make food and manufacture food whenever there is chlorophyll.

   2. The simplest plants are divided into two groups.

   3. Simple plants have characteristics in common.

   4. Simple organisms offer excellent material for studying plant cells and the interaction of plants with the environment and are found in many places on the earth.

   5. Green plants make their own food.

C. Certain groups of plants reproduce by seeds.

   1. Under the correct conditions, seeds will germinate and grow into plants.

   2. Seeds contain stored food materials.

   3. Roots have several functions: anchoring the plant, securing the food, storing the food.

   4. Plants and animals must adapt to their environment if they survive.

## III

## Experiences

A. Lesson Eighteen

1. Prepare a flannel board of beautiful mushrooms.
2. Discuss how some plants get food from other plants.
3. Let the children grow yeast in a flask.

B. Lesson Nineteen

1. Plan for the children to look at various things through a lens.
2. Bring in plants from an aquarium and study their cells.
3. Study a single cell under the microscope.
4. Gather algae and learn to prepare it to be viewed by lens.
5. Learn to identify several algae.
6. Bring in sponges and examine under a lens.
7. Observe the algae eating fish in your aquarium.

C. Lesson Twenty

1. Let the children plant different kinds of seeds and observe them as they develop.
2. Try reproducing plants by cuttings or other means of propagation.
3. Let the students run experiments to learn the necessary conditions for a seed to germinate and grow.
4. Investigate the differences in the leaves of corn and bean seeds as they germinate.

D. Lesson Twenty-One

1. Investigate the roots as the plant grows.

2. Grow plants using several things to anchor them in water.

3. Put coloring in the water that contains a plant and observe that the roots take in water and food.

4. Bring as many different kinds of roots to class as you can.

5. Study the plant roots we use for food.

E. Lesson Twenty-Two

1. Make a collection of seeds and sort them according to their ways of travel.

2. Make a study of the legs and feet of birds.

3. List a number of habitats and find at least one insect in each habitat.

4. Dig up a plant. Find all the ways you can in which it is fitted for living where it does.

5. Set up several different terrariums illustrating different habitats.

6. Plan an experiment to show the effects of varying amounts of light on different plants.

## LESSON EIGHTEEN

I. CONCEPT:

All simple plants are not green.

II. OBJECTIVES

A. To understand that one group of plants is dependent on others for food.

B. To develop an observing attitude and curiosity about living things.

C. To realize that there is interdependence among living things.

D. To gain a greater understanding of the plant kingdom.

E. To realize that dependent plants may be extremely poisonous.

F. To observe that the main part of a mushroom is underground.

III. PROBLEM:

To learn about plants that do not contain chlorophyll.

IV. INSTRUCTIONAL MATERIALS

A. Books
1. Dependent Plants, Bertha Morris Parker
2. Bacteria, Yeasts, and Molds, H. W. Conn
3. Plant World, Bertha M. Parker

B. Films:
Why Foods Spoil, EBF

## LESSON NINETEEN

I. CONCEPT:

There are hidden treasures in one-celled plants.

II. OBJECTIVES:

A. To become familiar with the use of a hand lens.

B. To develop an awareness of the characteristics of small plants.

C. To learn how to study and care for microscopic plants.

D. To learn the characteristics of a single cell.

E. To learn that the study of algae can be fascinating.

F. To become aware that some animals have organized their cells into groups.

G. To be aware that some plants grow in the water.

H. To better understand the difference in a seaweed and a seed plant.

III. PROBLEM:

To learn about microscopic plants.

IV. INSTRUCTIONAL MATERIALS:

A. Books
1. Play with Plants, Millicent E. Selsam
2. Through the Magnifying Glass, Julius Schwartz
3. The First Book of Plants, Alice Dickerson

B. Films
1. Simple Plants: Algae and Fungi, Cor
2. Measuring Temperature, YAF
3. Coco Explores a Pier, (RP)

## LESSON TWENTY

I. CONCEPT:

The highest group of plants reproduce by means of seeds.

II. OBJECTIVES

A. To learn that seeds produce plants like themselves.

B. To understand that there are given conditions necessary before a seed will germinate.

C. To be aware that the seed forms from the flower.

D. To observe that the stored food in the seed supplies the embryo plant with energy to begin growth.

E. To learn of the many uses of seeds.

III. PROBLEM:

To learn the requirements necessary for a seed to germinate.

IV. INSTRUCTIONAL MATERIALS

A. Books
1. First Book of Plants, Alice Dickinson Hoke
2. Play with Seeds, Millicent E. Selsam
3. The Wonders of Seeds, Alfred Stefferud
4. Seeds and More Seeds, Millicent E. Selsam
5. Seeds are Wonderful, V. K. Foster and Pearl Queree
6. The Carrot Seed, Ruth Krass
7. Bits That Grow Big, I. E. Webber
8. My Garden Grows, Aldren Watson
9. Plants in the City, Herman and Nina Schneider
10. Seeds by Wind and Water, Helene Jordan

B. Films
1. Seed Dispersal, EBF
2. How Plants Help Us, Cor

C. Filmstrips:
Seeds and Seed Travel, SVE

## LESSON TWENTY-ONE

I. CONCEPT:

Roots of plants vary in function.

II. OBJECTIVES

A. To develop an understanding of the function of the roots of plants.

B. To develop an awareness of the part the root plays toward providing man with food.

C. To inform the student that roots are sometimes storehouses for food.

D. To develop an interest in the different roots.

III. PROBLEM:

To learn of the importance of roots.

IV. INSTRUCTIONAL MATERIALS

A. Books
1. What Is a Plant?, Gene Darby
2. Growing Things, Frances R. Horwick and Reynald Werrenrath, Jr.
3. What's Inside Plants?, Herbert S. Zim

B. Films
1. Roots of Plants, EBF
2. Plants That Grow From Leaves, Stems, and Roots, Cor
3. Roots or Plants, EBF

C. Filmstrips
1. Plants Grow, JH
2. Growing New Plants, CS
3. Plants at School, NAS
4. Plant Growth, EBF

## LESSON TWENTY-TWO

I. CONCEPTS

A. Living things develop special means which enable them to survive and to deal with the problems they encounter.

B. Living things adapt themselves in numerous situations in order to survive.

II. OBJECTIVES

A. To stimulate curiosity about the adaptations of plants and animals.

B. To understand that living things may undergo changes to survive.

C. To show that there is a purpose for the numerous adaptations of plants and animals.

D. To cause an awareness that adjustments are necessary even in man.

E. To develop an appreciation of the problems that all living things encounter.

III. PROBLEM:

To learn that all living things sometimes undergo changes for their survival.

IV. INSTRUCTIONAL MATERIALS

A. Books
1. Walt Disney's Nature's Half Acre, Jane W. Watson
2. Plants and Animals, Jane W. Watson
3. Plants and Animals, Marie Neurath and J. A. Lauerys

B. Films
   1. Adaptations of Plants and Animals, Cor
   2. How Animals Defend Themselves, YAF
   3. Plant Traps, EBF

C. Filmstrips
   1. Animals Fit Themselves to Their Surroundings, EBF
   2. The Behavior of Plants, Curr F
   3. Communities of Living Things: Animals and Plants and Environment, YAF
   4. Balance Among Living Things, YAF

# UNIT FOUR

## MATTER, ENERGY, MACHINES

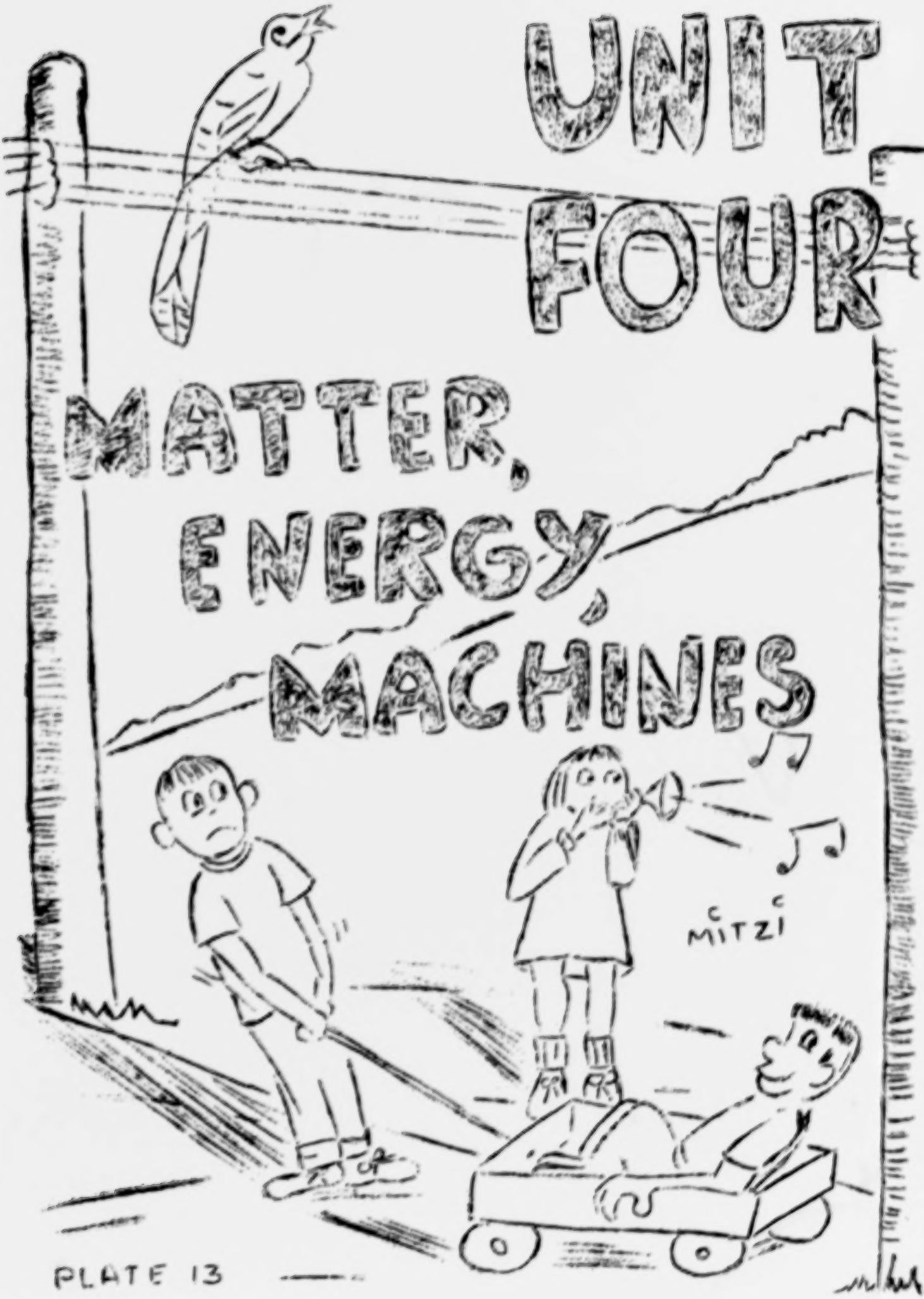



PLATE 13

# UNIT FOUR

## NON-LIVING THINGS

## MATTER, ENERGY, MACHINES

### I

### Introduction

Children develop an understanding of matter as they observe some of the familiar things around them. They use their senses to detect the presence of the many things that are too small to be seen. By beginning with the smaller simpler particles of matter they are able to develop an awareness of the fact that all matter is made up of small particles, atoms, and combinations of atoms, molecules. These molecules are in continuous motion.

The study of magnets introduces the student to the fact that magnetism has characteristics. This is a basic background for the study of electricity.

The follow-up of electricity emphasizes that matter is made up of small particles and introduces the fact that magnetism and electricity are generally studied together, as forms of energy. The two phenomena are not the same but are related. Both phenomena

are related to the movement of electrons. These interrelationships are introduced in this unit.

The study of light and sound, forms of energy, conclude the study of some forms of energy. The general characteristics of each is introduced.

An introduction to the simple machines follows the studies of energy because they use the several forms of energy to lead to advance study.

In conclusion, is a lesson emphasizing the State of Mississippi, the mockingbird, followed by the last lesson which is an evaluation of the years work.

## II

## Major Concepts

A. Our world is composed of matter.

   1. There are many different kinds of materials.

   2. Some matter is in some ways alike and in some ways different.

   3. There is an orderly arrangement of the small particles of matter.

B. A poison through its chemical action may kill, injure or impare an organism.

   1. Many familiar things are poisonous if incorrectly handled.

   2. Some plants, animals, and minerals are poisonous.

   3. Some things are poisons at some times and beneficial in other situations.

C. A great amount of planning goes into a well presented project.

   1. Many benefits are derived from group participation.

   2. It is beneficial to learn of the capabilities of others.

D. There are different kinds of magnets.

   1. All magnets are essential connection in the generation of electricity.

   2. The earth is a huge magnet.

   3. All magnets are surrounded by magnetic lines of force.

   4. All matter has an attraction for all other matter.

E. Electricity is useful to man.

   1. Electricity may be dangerous if not used properly.

2. Wires are used as pathways for an electrical current.

3. Electrical wires are generally covered with a non-conductor or insulator.

4. Some materials conduct currents well (conductors) while others do not conduct the current well (insulator).

F. Light is a form of energy.

1. Light has given characteristics.

2. Light will cast a shadow.

3. Light can go through some materials, and others it may go only partially through.

G. Sound is a form of energy.

1. Vibrations cause sound waves.

2. Our ears receive sound vibrations.

3. Our brain interprets sound vibrations.

4. Sounds are produced in many different ways.

5. Sounds travel best through solids, next best through liquids, and least well through gases.

6. Man uses sound in many ways.

7. Sound is used mainly for communication.

8. Some sounds are pleasant; others are unpleasant.

H. Machines make work easier for man.

1. Machines help us to do different kinds of jobs.

2. Different machines are used for different purposes.

3. Machines make it possible to do work with less effort.

4. Energy is put into a machine.

I. Our State Bird is the mockingbird.

1. The characteristics of the mocking bird

2. The life of the mockingbird

J. Summary

1. Remembrance

2. Evaluation

3. Conclusion

## III

## Experiences

A. Lesson Twenty-Three

1. Fill a tablespoon nearly full of powdered sulfur. Hold the spoon bowl in a flame until the sulfur melts and catches on fire. Then pour the burning sulfur into some cold water in a bowl. The sulfur will turn into a dark brown material. Let the children feel of it, (it feels like rubber).

2. Make a collection of things made of plastic.

3. Learn the name and symbol of some of the common atoms.

4. Make a collection of the metals: iron, copper, lead, and mercury.

B. Lesson Twenty-Four

1. List all poisons in the kitchen of each student.

2. Make a bulletin board showing many everyday poisons.

C. Lesson Twenty-Five

1. Visit a Science Fair.

2. Observe the scientific programs presented on national television.

3. Prepare a scientific display.

D. Lesson Twenty-Six

1. Display the different kinds of magnets.

2. List the many ways people use magnets.

3. Try the different metals to find out which ones will be attracted by the magnet.

4. List the number of magnets in use in your home or school.

5. Experiment to see what materials the magnetic lines of force will pass through.

6. Experiment to see if the distance between a magnet and a nail affects the force of attraction.

7. Heat a magnetic nail; cool it. Then note its loss of magnetic attraction.

8. Make a temporary magnet by rubbing a known magnet in one direction on a piece of soft iron.

9. Strike a magnetized nail. Notice the change in magnetic attraction it will have for other objects.

E. Lesson Twenty-Seven

1. List the number of electrical appliances in your kitchen.

2. Display an electrical cord that has frayed to illustrate that it might cause a short circuit.

3. Make a simple motor by attracting and repelling paper clips that are mounted so they turn readily.

4. Take a tour of the school to observe electrical appliances.

5. Ask the school custodian to show the children the main switch in the school. Discuss how electricity is distributed throughout the school.

6. Have reports on Thomas Edison.

7. Have the pupils set up a display of insulators and conductors.

8. We have all been at home when the electricity went off. What were some of the things that did not operate? Suppose that the electricity had not come back on for days, what would we have substituted for the appliances that would not work? What would we have done without?

9. Discuss what happens on the streets when electricity is off. In the stores. In the factory. On the farm.

10. Try and think of some of the "Permanent" magnets we have seen. (Don't forget toys) What do they attract? Are they strong? Can they be turned off?

11. Most of the electrical appliances we use produce power, heat, or light. List the appliances you use and put them in the proper category.

F. Lesson Twenty-Eight

1. Find things that light goes through, and will not go through.

2. List many uses of light.

3. Have students search for pictures of luminous objects.

G. Lesson Twenty-Nine

1. Plan an experiment to illustrate sound.

2. Find out some of the sounds that are regulated by law in your area.

3. Ask the students to make a list of all the sounds they hear in three minutes.

4. Experiment with an alarm clock to see how far one can hear it trying different media and distance.

5. Open a piano and have the students observe the length and thickness of the strings.

6. Use the gymnasium to demonstrate echoes.

H. Lesson Thirty

1. Collect simple machines and find out how they are all alike.

2. Have students prepare a bulletin board of the basic simple machines.

3. Bring toys to school and study the basic machines involved.

4. Experiment using the different simple machines.

5. Illustrate how a force can be transferred.

6. Examine simple machines to learn where the force is exerted.

I. Lesson Thirty-One

1. Cut out a picture of the mockingbird.

2. Review many good features about Mississippi.

## LESSON TWENTY-THREE

I. CONCEPT:

The atom is a particle of matter.

II. OBJECTIVES

A. To acquaint the student with an understanding of what matter is.

B. To create an interest in the smaller particles of matter.

C. To cause the student to be aware of the composition of some matter.

D. To help children to be conscious or aware of the many different kinds of materials around us.

E. To acquaint children with the work of the chemist. How he studies the different kinds of matter, learns what things are made of, and finds out how to make new materials by putting familiar ones together in new and different ways.

F. Help children to appreciate man made products that are so familiar to us and that we take for granted.

III. PROBLEM:

To find out how small an atom is.

IV. INSTRUCTIONAL MATERIALS

A. Books
1. Our Friend the Atom,Walt Disney, Henize Haber
2. All About the Atom, Ira M. Freeman
3. Atoms At Work, George Bischof

B. Films
1. Explaining Matter: Molecules in Motion, EBF
2. Nothing But Air, Cor

C. Filmstrips
1. Air and Its Properties, YAF
2. The Story of the Air, EBF

## LESSON TWENTY-FOUR
(Interrelated)

I. CONCEPT:

An understanding of materials can prevent many poison accidents.

II. OBJECTIVES

A. To familiarize the student with the many poisons we are associated with in our surroundings.

B. To cause an awareness of a need to follow instructions.

C. To learn that care must be taken in the handling and storing of household articles that are poisonous if used incorrectly.

III. PROBLEM:

To learn some harmful household articles.

IV. INSTRUCTIONAL MATERIALS

A. Films
1. Children at Play with Poisons, Mississippi State Board of Health
2. Poison in Your House, Mississippi State Board of Health

## LESSON TWENTY-FIVE
(Interrelated)

I. CONCEPT :

Every student that takes part in a group activity gains knowledge.

II. OBJECTIVES

A. To gain an opportunity for the students to display their scientific talent.

B. To offer an opportunity for the students to observe the work of their fellow students.

C. To encourage the students to take part in school projects.

D. To let the student become aware that a scientific display requires many skills.

E. To teach the students to follow rules and to encourage group activity.

III. PROBLEM :

To learn the rewards of scientific labor.

IV. INSTRUCTIONAL MATERIALS

A. Books

1. Experiments in Science, N. F. Beeler and F. M. Branley
2. Science Projects You Can Do, George Stone
3. Experimental Physics Is for Young People, Alexander Efron
4. Experiments in Magnetism and Electricity, Harry Sooten
5. Research Adventures for Young Scientists, George Barr
6. Ideas for Science Fair Projects, Faucett Book 520
7. Science Fair Handbook, Mississippi Academy of Science

## LESSON TWENTY-SIX

I. CONCEPT:

Like poles of a magnet repel and unlike poles attract.

II. OBJECTIVES:

A. To show that magnets may be artificial or natural.

B. To become aware that the poles are more strongly magnetized.

C. To show that only certain metals can be magnetized.

D. To show that unlike poles attract and like poles repel.

E. To have an awareness that the lines of force of magnetism go through various materials.

F. To learn to use a compass.

III. PROBLEM:

To learn what a magnet is

IV. INSTRUCTIONAL MATERIALS:

A. Books
1. What is a Magnet?, Gabriet Rueben and Gloria Archer
2. The Marvelous Magnet, Harry Scotin
3. First Book of Electricity, Sam and Beryl Epstein
4. Magnets and How to Use Them, Tillie Pine and Joseph Levine
5. A Boy's Book of Magnetism, Raymond Yates
6. Mickey's Magnet, Franklyn M. Branley and Eleanor K. Vaughn
7. True Book of Science Experiments, Illa Pondendorf

B. Films
1. Electromagnets, YAF
2. Magnetism, Cor
3. Magnets, YAF
4. Michael Discovers the Magnet, EBF

5. Electric Magnets, SVE
6. Magnets, EBF
7. The Magnet, Official

C. Filmstrips
1. Electric Magnets, SVE
2. Permanent Magnets, SVE
3. Magnets, YAF
4. Electromagnets, YAF
5. Magnets and Electricity, SVE
6. Magnetism, YAF
7. Making Electricity, EBF

## LESSON TWENTY-SEVEN

I. CONCEPTS

A. Introduction

1. Electricity, its production and use, plays an ever increasingly important role in our daily living. Since it cannot be seen, heard, smelled, etc., understanding its fundamental characteristics is sometimes judged difficult. The task becomes much easier also when the student has an awareness of and interest in electricity and its importance.

B. Electricity has many characteristics.

C. Electricity and magnets may be produced and used for many purposes.

II. OBJECTIVES

A. To gain an interest in the study of electricity.

B. To become more aware of the important role of electricity in everyday living.

C. To learn the fundamentals of magnetism and its relation to electricity.

D. To relate electro-magnetism to power and simple electrical machines.

E. To begin to understand how electricity can be used to produce heat and light.

III. PROBLEM:

To cause the student to learn the basic facts of magnetism and electricity.

IV. INSTRUCTIONAL MATERIALS

A. Books

1. Experiments with Electricity, Nelson Beeler and Franklyn Branley

2. All About Electricity, Irs M. Freeman
3. Picture Book of Electricity, Jerome Mayer
4. Let's Look Inside Your House, Herman and Nina Schneider
5. I Know A Magic House, Julius Schwartz
6. The Marvelous Magnet, Harry Sootin
7. Mr. Bell Invents the Telephone, Katherine Shippen

B. Films
1. Electricity: How To Make a Circuit, EBF
2. Flow of Electricity, YAF
3. Learning About Electric Current, EBF

C. Filmstrips:
Electricity in Communication, Curr F

## LESSON TWENTY-EIGHT

I. CONCEPT:

Light passes through some objects, is reflected by others, and is absorbed by others.

II. OBJECTIVES

A. To develop an understanding of the nature of light.

B. To show how light functions.

C. To cause an awareness that light travels in a straight line.

D. To develop an understanding that light produces heat.

E. To show that we see with our eyes.

F. To understand that we need light in order to see an object.

III. PROBLEM:

To learn how light helps us to see.

IV. INSTRUCTIONAL MATERIALS

A. Books
1. What Could You See?, Heanne Bendick
2. Experiments With Light, Nelson F. Beeler and Franklin N. Branley
3. Let There Be Light, Lillian Bragdon
4. Look and See, Georgiana K. Browne
5. The Adventure of Light, Frank Jupo
6. Shadows, Larry Kettlekamp
7. Too Small To See, Marie Neurath
8. Lens Magic, Frances Rogers

B. Films
1. Light and Heat, YAF
2. Light and Shadow, EGF

3. Light and Heat, EGF
4. Measuring Temperature, YAF
5. Light and Shadow, YAF

C. Filmstrips
1. Light, EBF
2. Light, YAF
3. Light in Our Daily Lives, EGF

## LESSON TWENTY-NINE

I. CONCEPT:

Sound is produced by vibrating matter.

II. OBJECTIVES

A. To give the student an opportunity to learn that sounds are produced by vibrating bodies.

B. To enable the student to learn that sound is produced by many different sources.

C. To let the student know that objects can be identified by the sounds they produce.

D. To develop an awareness that sounds differ from one another in many ways.

E. To learn of the many uses of sounds.

III. PROBLEM :

To acquaint the student with evidence that vibrations cause sound.

IV. INSTRUCTIONAL MATERIALS

A. Books
1. Sounds All Around, Tillie Pine and Joseph Levine
2. The True Book of Sounds We Hear, Illa Podendorf
3. The First Book of Sound, David Knight
4. Sounds You Cannot Hear, Eric Windle

B. Films
1. Sounds All Around Us, Cor
2. Sounds for Beginners, Cor
3. Communication for Beginners, Cor
4. Sound and How It Travels, EBF

C. Filmstrips
1. Finding Out About Sound, SVE
2. Sound, EBF
3. Sounds We Hear, SVE

## LESSON THIRTY

I. CONCEPT:

Man uses machines to his advantage.

II. OBJECTIVES

A. To help children to understand that there are basic simple machines.

B. To develop the awareness that each type of machine has specific advantages.

C. To become aware that no work is saved by a machine.

D. To develop the proper attitude toward a machine and safety principles.

E. To develop a beginning knowledge of the care of machines.

III. PROBLEM:

To learn what machines do to make your work easier.

IV. INSTRUCTIONAL MATERIALS

A. Books

1. Machines at Work, Mary Elting
2. True Book of Tools of Building, Jerome Leavitt
3. What's Inside of Engines?, Herbert Zim
4. Tools in Your Life, Irving Adler
5. Doing Work, Glenn Blough
6. Man and His Tools, William Burns
7. Everyday Machines and How They Work, Herman Schneider
8. Now Try This, Herman and Nina Schneider
9. Simple Machines and How They Work, Elizabeth Sharp
10. Things Around the House, Herbert Zim
11. About Wonderful Wheels, Freenie Ziner
12. Now Try This, To Move a Heavy Load, Herman and Nina Schneider

13. True Book of Toys at Work, John Lewellen
14. Simple Machines, Jeanette Smith

B. Films
1. How Machines and Tools Help Us, Cor
2. Machines Do Work, YAF

C. Filmstrips
1. The Wonder of the Steam Engine, EGF
2. Machines That Help the Farmer, FAC
3. Machines That Move the Earth, FAC
4. Machines, EBF
5. Simple Machines, YAF
6. Simple Machines Help Us Work, JH

LESSON THIRTY-ONE
(Interrelated)

I. CONCEPT:

The mockingbird is our state bird.

II. OBJECTIVES

A. To learn the relationship of the mockingbird to the state of Mississippi.

B. To better understand the life of the mockingbird.

C. To gain an appreciation for birds.

D. To recognize the mockingbird.

E. To recognize the song of the mockingbird.

III. PROBLEM:

To learn to recognize a mockingbird and become familiar with his habits.

IV. INSTRUCTIONAL MATERIALS

A. Books
1. Tony's Birds, Millicent Selsam
2. Birds in the Big Woods, Glen Blough
3. Birds, Bertha Morris Parker

B. Filmstrips
1. Looking at Birds, Bray
2. Audubon's Birds of America, EBF
3. Development of Natural Resources In Mississippi, MFI

LESSON THIRTY-TWO
(Interrelated)

I. CONCEPT:

All phases of science are interrelated; a study of one field leads to an understanding of the others.

II. OBJECTIVES

A. To recall to memory some of the subjects discussed.

B. To re-emphasize important ideas.

C. To continue developing curiosity and interest in ones environment.

D. To leave the thought that all things made of God are good.

III. PROBLEM:

To review some of the things we learned during the year.

## BOOKS FOR TEACHERS


Asimov, Isaac, The New Intelligent Man's Guide to Science, New York: Basic Books, Inc.

Blough, Glenn O. and Julius Schwartz, Elementary School Science and How To Teach It, New York: Holt, Rinehart and Winston, 1964.

Blough, Glenn O. and Albert Huggett, Elementary School Science and How To Teach It, New York: The Dryden Press.

Blough, Glenn O., Julius Schwartz, and Albert J. Huggett, Elementary School Science and How To Teach It (Revised Edition), New York: Holt, Rinehart and Winston.

Carin, Arthur, and Robert Sund, Teaching Science Through Discovery, Columbus, Ohio: Charles E. Merrill Books, Inc.

Craig, Gerald S., Science for the Elementary School Teacher, Boston: Ginn and Company, 1958.

Croxton, W. C., Science in the Elementary School, New York: McGraw-Hill Co., Inc.

Hone, Joseph and Victor, Teaching Elementary Science: A Source-book for Elementary Science, New York: Harcourt, Brace and World, Inc.

Navarra, John Gabriel and Joseph Zafforoni, Science Today for the Elementary School Teacher, New York: Harper & Row, 1963.

Tannebaum, Harold E., Nathan Stillman, and Albert Piltz, Science Education for Elementary School Teachers, Boston: Allyn and Bacon, Inc.

Victor, Edward, Science for the Elementary School, New York: Macmillan, 1965.

## SUPPLEMENTARY MATERIALS

Aids for Health Teaching -
Health and Welfare Division
Metropolitan Life Insurance Company
1 Madison Avenue
New York, New York 10010

Algea in Water Supplies -
U. S. Public Health Series Service Publication No. 657
U. S. Printing Office
Washingtnn D. C. 20402 price $1.00

"Inside the Atom" -
Educational Relations Department
M W H General Electric Co.
Schenectady 5, New York

Periodic Chart of the Elementa -
Merck and Company
Rakway, New Jersey

Secure a card from the Bureau of Pharmaceutical Services telling how the public should deal with poison cases.
Bureau of Pharmaceutical Services
School of Pharmacy
University of Mississippi

Free classroom game, "Ring the Bell" -
Breakfast Game
Kellogg Company
Home Economics Services
Department 19-65
Battle Creek, Michigan 49016

"Working with Science" -
Department of Education
Jackson, Mississippi

List of Approved Materials for Elementary Science -
Department of Education
Jackson, Mississippi

"Let's Collect Rocks" -
"Let's Collect Shells" -
Shell Oil Company
P. O. Box 60193
New Orleans, Louisiana 70160

## FILM AND FILMSTRIP COMPANIES

| | |
|---|---|
| AIF | Almanac Films, Inc.<br>519 Fifth Avenue<br>New York 18, New York |
| Barr | Arthur Barr Productions<br>6211 Arroyo Glen<br>Los Angeles 42, California |
| CW | Churchill-Wexler Film Productions<br>801 North Seward St.<br>Los Angeles 38, California |
| Cor | Coronet Films<br>Coronet Building<br>Chicago 1, Illinois |
| Birad | Birad Corporation<br>35 West 53rd St.<br>New York 19, New York |
| EBF | Encyclopaedia Britannica Films<br>1150 Willmette Ave.<br>Willmette, Illinois |
| IF | Instructional Films, Inc.<br>1150 Willmette Ave.<br>Willmette, Illinois |
| Pictorial | Pictorial Films, Inc.<br>1501 Broadway<br>New York 19, New York |
| Sterling | Sterling Films, Inc.<br>6 East 39th St.<br>New York, New York |

| | |
|---|---|
| YAF | Young America Films, Inc.<br>19 East 41st St.<br>New York 17, New York |
| Curr F | Curriculum Films<br>American Educational Projections Corporation<br>1319 Vine St.<br>Philadelphia, Penn. |
| EGF | Eye Gate House, Inc.<br>2716 41st St.<br>Long Island City 1, New York |
| FH | The Filmstrip House<br>347 Madison Ave.<br>New York 17, New York |
| CS | Charles Scribner's Sons<br>Educational Dept.<br>597 Fifth Ave.<br>New York 17, New York |
| KB | Knowledge Builders<br>Visual Education Center Building<br>Floral Park, New York |
| JH | Jam Handy Organization<br>2821 East Grand Boulevard<br>Detroit 11, Michigan |
| PDP | Pat Dowling Pictures<br>1056 South Robertson Boulevard<br>Los Angeles 35, California |
| SVE | Society for Visual Education, Inc.<br>1345 West Diversey Parkway<br>Chicago 14, Illinois |
| UW-Educ | Educational Film Department<br>United World Films, Inc.<br>1445 Park Ave.<br>New York 29, New York |

| | |
|---|---|
| Cyanamid | American Cyanamid Co.<br>Lederle Laboratories Division<br>Pearl River, New York |
| Bailey | Bailey Films, Inc.<br>6509 De Longpre Ave.<br>Hollywood 28, California |
| Bray | The Bray Studios, Inc.<br>729 Seventh Ave.<br>New York 19, New York |
| FAC | Film Associates of California<br>10521 Santa Monica Boulevard<br>Los Angeles, California 90025 |
| Cenco | Cenco Educational Films<br>1700 Irving Park Road<br>Chicago, Illinois 60613 |
| PS | Popular Science Publishing Co.<br>Audio-Visual Division<br>353 Fourth Ave.<br>New York 10, New York |
| NAS | National Audubon Society<br>1130 Fifth Ave.<br>New York 28, New York |
| IBF | International Film Bureau<br>57 East Jackson Boulevard<br>Chicago 4, Illinois |
| NET | National Educational Television<br>Film Service<br>Indiana University<br>Bloomington, Indiana |
| Moody | Moody Institute of Science<br>11428 Santa Monica Boulevard<br>Los Angeles 25, California |

| | |
|---|---|
| TFC | Teaching Film Custodians, Inc.<br>25 West 43rd St.<br>New York 36, New York |
| WLF | Wild Life Films<br>5149-5151 Strolm Ave.<br>North Hollywood, California |
| MFI | Mississippi Filmstrip, Inc.<br>Box 165<br>Natchez, Mississippi |
| VS | Visual Sciences<br>Box 599-HW<br>Suffern, New York |
| Photo Lab | Photo Laboratory, Inc.<br>3825 Georgia Ave., N.W.<br>Washington, D. C. |

# BIBLIOGRAPHY


Asimov, Issac, The New Intelligent Man's Guide to Science, New York: Basic Books, Inc., 1960.

Bay Region Instructional Television for Education KQED Instructional Television Service, San Francisco.

Berkley United School District, Teacher's Guide for Science in the Primary Grades, Berkley, 1957.

Blough, Glenn O., Elementary School Science and How to Teach It, New York: Dryden Press, 1958.

Bond, Austin D. and Guy L., Science Series, Atlanta: Lyons and Carnahan, 1965.

Brandwein, Paul F., Concepts In Science, Atlanta: American Book Company, 1965.

Caring, Arthur, Teaching Science Through Discovery, Columbus, Ohio: Charles E. Merrill Books, Inc., 1965.

Craig, Gerald S., Science for the Elementary School Teacher, Atlanta: Ginn and Company, 1958.

Craig, Gerald S., Science For You, Atlanta: Ginn and Company, 1965.

Frasier, George Willard, Science Series, Chicago: L. W. Singer and Company, 1962.

Jacobson, Willard, Modern Elementary School Science, Columbia: Teachers College Bureau of Publication, 1961.

Jacobson, Willard, Science Series, Atlanta: American Book Co., 1965.

McComb Elementary Schools, Outline for Teaching Elementary Science Grades 1 - 6, McComb, Mississippi, 1963.

Mallinson, George G., Science 3, 4, 5, 6, Atlanta: American Book Company, 1965.

Navarra, John Gabriel, Science Today for the Elementary School Teacher, New York: Harper and Row, 1960.

Nelson, Leslie W., Science Activities for Elementary Children, Dubuque, Iowa: Wm. C. Brown Company, 1965.

Schneider, Herman and Nina, Science Series, Boston: D. C. Heath and Company, 1964.

South Huntington Schools, Science in the Elementary School, New York: Union Free School District No. 13.

Steck-Vaughn Science Series, Austin, Texas, 1961.

Tannenbaum, Harold E., Science Education for Elementary School Teacher, Boston: Allyn and Bacon, Inc., 1965.

Thurber, Walter A., Exploring Science, Atlanta: Allyn and Bacon, Inc., 1964.

Van Atta, Frieda E. V., How To Help Your Child In Grade School Science, New York: Random House, 1962.

Visner, Harold, Simple Science Experiments, Palisades, New Jersey: Franklin Publishing Company, Inc., 1960.

Webb, James E., What's Up There?, Washington: U. S. Government Printing Office, 1964.